ORIGINAL

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

MATRIX ENERGY, LLC	)	
FOR DETERMINATION OF	)	**CASE NO. 2003-00228**
RETAIL ELECTRIC SUPPLIER	)	

Direct testimony of the following:

Bruce A. Davis, Jr.
David Estepp
Arlie Daniel
Greg McKinney

On behalf of Big Sandy Rural Electric Cooperative Corporation

Bruce A. Davis Jr
Testimony

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In the Matter of:

MATRIX ENERGY, LLC FOR DETERMINATION OF RETAIL ELECTRIC SUPPLIER	)))	CASE NO. 2003-00228

TESTIMONY OF BRUCE A. DAVIS, JR.

****

1. Please state your name and business address?

   A. Bruce A. Davis, Jr., Big Sandy Rural Electric Cooperative Corporation, 504 11th Street, Paintsville KY 41240-1422 (hereinafter "Big Sandy")

2. By whom are you employed and what is your job title and duties?

   A. Big Sandy. President/General Manager. Responsible for overseeing the day to day operations and management of the Co-op.

3. How many years have you been employed by Big Sandy RECC?

   A. 35 years.

4. State all the different job duties you have performed for Big Sandy throughout your working life?

A. Dispatcher, Engineering , Assistant Plant Superintendent, President/General Manager.

5. Did you attend a meeting on January 3, 2002 at Big Sandy's office to discuss a request by Beech Fork ("Matrix") for electric service to a new shaft mine located in Johnson County?

A. Yes.

6. Please summarize the discussions of the meeting?

A. Beech Fork requested electric service for a new shaft mine located in Johnson County. Their initial Electric demand was estimated to be 5 – 10 MW. They requested temporary service in November 2002 and service for the mine in January 2003. Big Sandy agreed to proceed with plans to provide this service.

7. Did Big Sandy give KU (AEP) consent to provide temporary electric service For construction of the mine entrance?

A. No.

8. Please comment on Matrix's claim that Big Sandy provided KU (AEP) with written and verbal consent for the temporary service.

A. That claim is not accurate. Our letter dated September 6, 2001, which Matrix relies on, does not pertain to the new shaft mine. This letter pertained to a different mine. If we had written a consent letter on September 6, 2001, consenting for AEP to provide temporary electric service for the new mine, there would have been no need for a meeting with Beech Fork in January 2002, informing Big Sandy of the new mine. Also, Big Sandy has never verbally granted anyone consent to provide service in their exclusive territory, and we did not do so on this occasion. Finally, Big Sandy cannot give the customer written or verbal consent concerning our certified territory.

9. Do you have Big Sandy's letter dated September 6, 2001, which you wrote and signed to AEP?

A. Yes.

10. Will you file this letter as an exhibit, marked for identification as "Big Sandy Ex.1", and make it part of your evidence in this case?

A. Yes.

11. Do you have any further testimony?

A. Big Sandy is fully willing and capable of providing dependable

electric service to this new mine and to the future bore holes. The most economical means of doing this is by way of the interconnect with the "AEP" transmission line.

Bruce A. Davis, Jr.

STATE OF KENTUCKY

COUNTY OF JOHNSON

SUBSCRIBED AND SWORN to and acknowledged before me Bruce A. Davis Jr, this the 17th day of October 2003.

My Commission expires: 8-28-06

Janet Horne
NOTARY PUBLIC, STATE AT LARGE

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the foregoing was mailed, first class postage prepaid to the following on October 23, 2003:

Mark R. Overstreet, Esq.
Stites & Harbison, PLLC
421 W. Main Street
P O Box 634
Frankfort KY 40602-0634

Robert C. Moore, Esq.
Hazelrigg & Cox, LLP
415 W. Main Street, 1st Floor
P O Box 676
Frankfort KY 40602-0676

Albert A. Burchett
Attorney for Big Sandy RECC
P O Box 0346
Prestonsburg KY 41653

Big Sandy Ex. 1

ORIGINAL

SEP 26 REC'D

Big Sandy Rural Electric Cooperative Corporation

504 11th Street
Paintsville, Kentucky 41240-1422
(606) 789-4095 • Fax (606) 789-5454

Branch Office:

Box 8, Glyn View Plaza
Prestonsburg, KY 41653
(606) 886-2987

September 6, 2001

RECEIVED
OCT 23 2003
PUBLIC SERVICE COMMISSION

American Electric Power
3249 North Mayo Trail
Pikeville KY 41501

Gentlemen:

Please consider this letter your company's authorization to temporarily serve a new 2,000 KVA substation for Beechfork Mining located at the Sycamore Fork of Daniels Creek, which is in our service territory. However, any further sites located within our territory must be served by Big Sandy RECC, unless otherwise agreed to.

Please indicate your company's agreement by signing below and returning an executed copy to me.

Sincerely,

Bruce A Davis, Jr.
President/General Manager

BD/jh

C: Beechfork Mining

Agreed by _____
American Electric Power

"Big Sandy Ex. 1"

David Estepp
Testimony

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

MATRIX ENERGY, LLC FOR DETERMINATION OF RETAIL ELECTRIC SUPPLIER	)))	CASE NO. 2003-00228

TESTIMONY OF DAVID ESTEPP

****

1. **Please state your name.**

   ANSWER: David Estepp

2. **What is your educational background?**

   ANSWER: I received a Bachelor of Business Administration from Eastern Kentucky University in 1990.

3. **By whom are you employed and what is your job title and duties?**

   ANSWER: I am employed by Big Sandy RECC as the manager of Finance & Administration. My duties include financial management of all cooperative operations and administrative functions. I am also responsible for all regulatory compliance issues.

4. **Would you summarize the events regarding Big Sandy RECC and a proposed new coal mine in Johnson County which has become known as the Matrix mine.**

   ANSWER: On January 3, 2002, Big Sandy RECC met with representatives from Beeckfork Mining Co. to discuss electrical service for a proposed new shaft mine. Also present at this meeting was Big Sandy RECC's contract engineer, James Bridges and East Ky Power engineer, Greg McKinney. Beechfork originally estimated the mine's load to be between 5,000 and 10,000 KW, later figures revealed that the load

would only be about 3,300 KW. Beechfork expressed their need for power within the next 13 months. Start-up power for the mine would be needed in November 2002 with full power needed by January 2003.

In this initial meeting, it was discussed that Beechfork owned the land and could provide Big Sandy RECC with any easement necessary. Also discussed was the site preparation for the temporary substation that would be needed to serve the new mine. Beechfork agreed to perform any site prep required for the substation.

EKPC explained to Beechfork that we probably would be tapping AEP's transmission line that was in the area. EKPC further explained that and impact study would have to be preformed by AEP to determine if there were any problems with this request. EKPC also explained that we would have to build approximately 1.6 miles of transmission line to the new substation site. The site for the new substation will be located near the main entrance to the mine.

At the close of this meeting it was agreed upon by all parties to proceed with preparing estimates and plans for this project.

On February 25, 2002, EKPC met with AEP in Ohio to discuss the potential tap associated with this service, and on March 25, 2002, EKPC drafted a request to AEP to initiate the Facilities Study Agreement and the System Interconnection Study Agreement.

On April 15, 2002, Big Sandy RECC met with Beechfork and EKPC. It was proposed to Beechfork to tap AEP's 69KV line and build the needed transmission line to the substation. The projected cost of the project were, $172,000 for the substation and $267,000 for the transmission. EKPC would agree to accept $4,000 per month for 60 months, as long as Beechfork prepared the site for the substation and provided the easements for the transmission line. The next step was to get AEP's approval.

On June 5, 2002, AEP completed the System Impact Study for the Beechfork project. According to their study, the load does not introduce any major problems for AEP. EKPC then proceeded to make a Facilities Study request to AEP.

On June 7, 2002, EKPC requested a Facility Study to be performed by AEP. Along with the request went a check for $10,000 – which was part of the original amount to provide service.

In August 2002, AEP completed the Facility Study. The Study noted everything required by EKPC to complete to tap. Everything was ready to construct.

In the Fall of 2002, Beechfork informed Big Sandy RECC that initial electric service would not be needed until a later date – possible the summer of 2003.

In November 2002, EKPC had fully completed all studies required to construct Beechfork project. The total amount that EKPC paid for the System Impact Study and the Facilities Study equaled $21,454.47. As of this date, Beechfork has still not paid this bill.

Sometime in early 2003, Big Sandy RECC contacted Beechfork about the project and the outstanding bill. Beechfork's reply was that the project has been delayed again – this time until late 2003.

On April 16, 2003, EKPC sent a letter to Big Sandy RECC requesting information about the status of the project. EKPC stressed the fact that significant time lapse between proposed project energization date and the System Impact & Facilities Studies can result in study costs and transmission costs if system conditions change. If AEP required another study to be performed, Beechfork's project could be delayed.

Then on June 13, 2003, Big Sandy RECC received a forwarded copy of a letter from Matrix Energy addressed to the PSC requesting that AEP be granted permission to serve the Beechfork Mine, citing potential duplication of service facilities.

5. **At any time did Big Sandy RECC give verbal or written permission to AEP for temporary electrical service at the location of the Matrix Mine?**

   ANSWER: No.

6. **During your many conversations with Paul Horn, did Mr. Horn ever mention any potential territorial disputes, the need for bore holes or the needing 34.5 KV power?**

   ANSWER: No. Paul Horn never mentioned any of these issues.

7. **Did you ever discuss electric rates with Paul Horn?**

   ANSWER: In March 2002, I telephoned Paul Horn and offered to come to his office and discuss the different rate options that Big Sandy RECC had to offer, but I never received an invitation to do so.

8. **Did you ever discuss, with Paul Horn, a proposal for the transmission costs associated with the new mine?**

   ANSWER: Yes, in April 2002, I discussed with Paul Horn the projected transmission cost that East Kentucky Power (EKP) had given me. The amount was $267,000. I informed Paul Horn that Big Sandy RECC and EKP were willing to accept $4,000 per month for five (5) years, as long as, Beechfork provided right-of-way and substation site preparation. The legal documents were to be signed before construction began, and due to Beechfork's delays, the documents never were presented for execution. Big Sandy RECC rushed to perform every needed study and analysis in good faith that Beechfork would do what they had proposed.

9. **Does this conclude your testimony?**

   ANSWER: Yes.

David Estepp

STATE OF KENTUCKY

COUNTY OF JOHNSON

SUBSCRIBED AND SWORN to and acknowledged before me by David Estepp, this 22nd day of October 2003.

My Commission expires: 8-28-06

NOTARY PUBLIC, STATE AT LARGE

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the foregoing was mailed, first class postage prepaid to the following on October 23, 2003:

Mark R. Overstreet, Esq.
Stites & Harbison, PLLC
421 W. Main Street
P O Box 634
Frankfort KY 40602-0634

Robert C. Moore, Esq.
Hazelrigg & Cox, LLP
415 W. Main Street, 1st Floor
P O Box 676
Frankfort KY 40602-0676

Albert A. Burchett
Attorney for Big Sandy RECC
P O Box 0346
Prestonsburg KY 41653

Arlie Daniel
Testimony

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

MATRIX ENERGY, LLC FOR DETERMINATION OF RETAIL ELECTRIC SUPPLIER	)))	CASE NO. 2003-00228

TESTIMONY OF ARLIE O. DANIEL

****

1. **Please state your name and business address?**

   A. **Arlie O. Daniel, Big Sandy Rural Electric Cooperative Corporation, 504 11th Street, Paintsville KY 41240-1422 (hereinafter "*Big Sandy*")**

2. **By whom are you employed and what is your job title and duties?**

   A. **Big Sandy. Plant Superintendent.**

3. **How many years have you been employed by Big Sandy RECC?**

   A. **38 years.**

4. **Did you attend a meeting on January 3, 2002 with Ted McGinnis and Paul Horn concerning the new mine shaft planned for located in Johnson County?**

   A. **Yes.**

5. State what you remember?

A. Mr. McGinnis and Mr. Horn were planning a new coal mine in Johnson County and wanted Big Sandy to provide electric service. A new substation would be built and East Kentucky Power Cooperative (EKPC) would interconnect AEP's 69 KV transmission line for the source of power.

6. Are you familiar with Big Sandy's letter to AEP dated September 6, 2001?

A. Yes.

7. Does that letter apply to the new shaft mine?

A. No.

8. Have you prepared a map showing the location of the mine to which the letter applies?

A. Yes.

9. Does this map also show the location of the proposed new mine?

A. Yes.

10. Describe everything that the map depicts?

A.
(1) Johnson County – Martin County Line.
(2) Right Fork of Daniels Creek.
(3) Sycamore Creek.
(4) Location of mine (red) to which September 6, 2001 letter applies.
(5) Location of Beech Fork Mine (yellow). Big Sandy was Serving in September 2001.
(6) Location of new (Matrix) mine.

(7) **Big Sandy distribution line on Right Fork of Daniels Creek and Sycamore Creek in Johnson County.**

(8) **It shows the end of Big Sandy's distribution line on the Right Fork of Daniels Creek.**

(9) **It shows account numbers, map block numbers, line switches, distribution line and circuits.**

11. **With regard to Big Sandy's distribution facilities shown on the map, can you provide the following information?**

(a) **Distance between end of Big Sandy distribution line and new mine.**

A. **Approximately 4,000 feet. The map is 1 inch equals 2,000 feet.**

(b) **Date distribution facilities were first built on Right Fork of Daniels Creek.**

A. **Our records show a residential service started in January 1955.**

(c) **Date Big Sandy first started serving Beech Fork Coal Mines and in Particular the mine on Sycamore Creek.**

A. **Big Sandy has served at least seven coal mines for Beech Fork Processing, beginning in June 1987 and continuing through today's date.**

(d) **Condition of distribution facilities on Right Fork of Daniels Creek.**

A. **The system is in good condition and provides reliable service. Big Sandy regularly inspects and changes poles and lines. Right of way is cut as needed.**

(e) **Are any of these facilities sufficient to serve the new (Matrix) mine? If not why not?**

A. **No. The distribution wires are not large enough to serve the Load for the new mine.**

13. State if you know the purpose of September 6, 2001 consent letter to AEP?

A. To serve mine No. 2 as shown on map.

14. After mine #1 as depicted on map closed down, did Big Sandy serve mine #2, show on map?

A. Yes.

15. Will you file the map as an exhibit, marked for identification as "Big Sandy No. 2", and make it part of your testimony in this case?

A. Yes.

16. Do you have further testimony?

A. No.

Arlie O. Daniel
Arlie O. Daniel

STATE OF KENTUCKY

COUNTY OF JOHNSON

SUBSCRIBED AND SWORN to and acknowledged before me Arlie O. Daniel, this the 20th day of October 2003.

My Commission expires: 8-28-06

Janet Horne
NOTARY PUBLIC, STATE AT LARGE

CERTIFICATE OF SERVICE

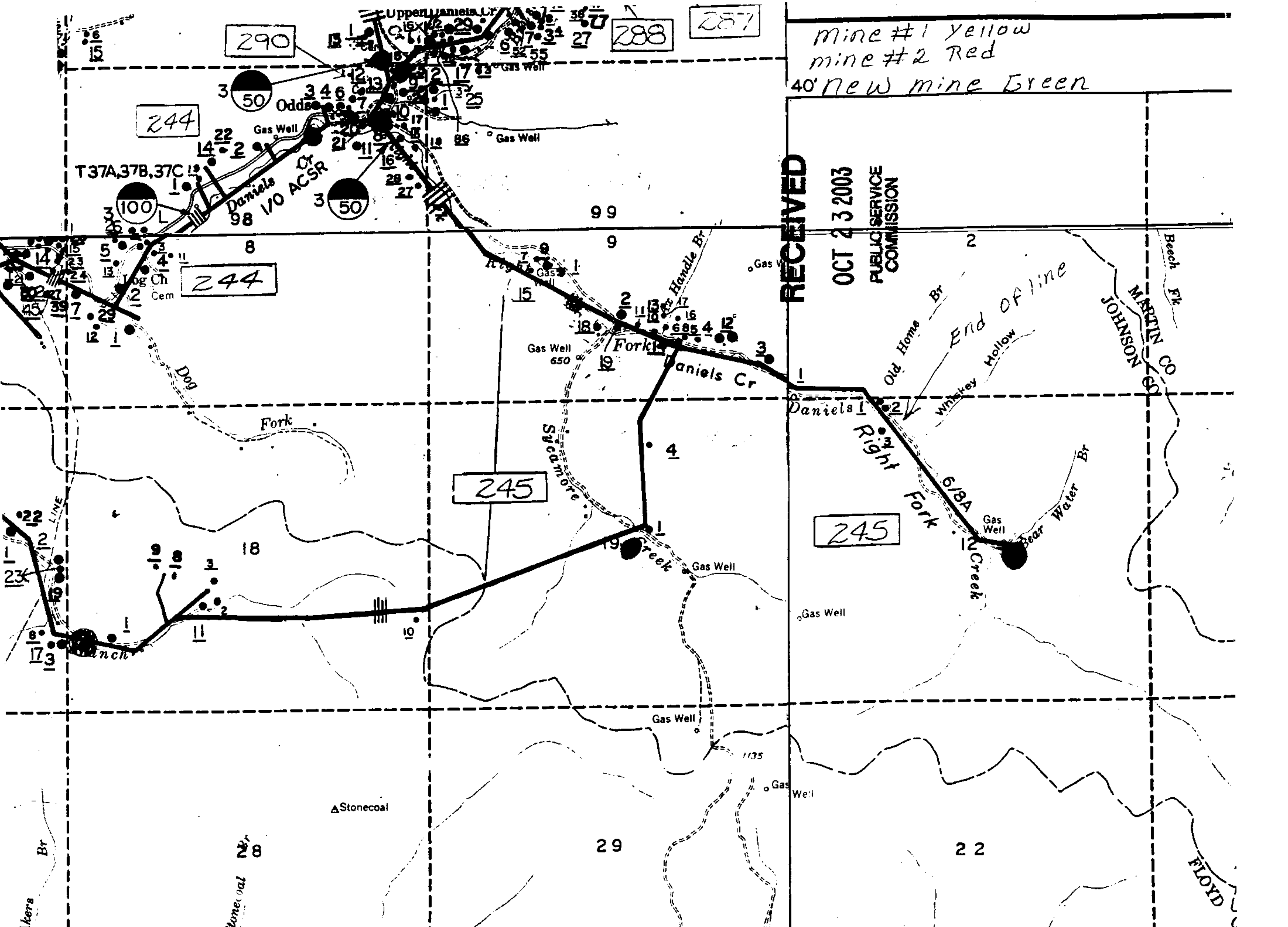
The undersigned hereby certifies that a true and correct copy of the foregoing was mailed, first class postage prepaid to the following on October 23, 2003:

Mark R. Overstreet, Esq.
Stites & Harbison, PLLC
421 W. Main Street
P O Box 634
Frankfort KY 40602-0634

Robert C. Moore, Esq.
Hazelrigg & Cox, LLP
415 W. Main Street, 1st Floor
P O Box 676
Frankfort KY 40602-0676

Albert A. Burchett
Attorney for Big Sandy RECC
P O Box 0346
Prestonsburg KY 41653

Big Sandy Ex. 2



mine #1 Yellow
mine #2 Red
40' New mine Green
RECEIVED
OCT 2 3 2003
PUBLIC SERVICE COMMISSION
End of line
244
245
290
288
287
T37A,37B,37C
98 1/0 ACSR
6/8A
Daniels Cr
Right Fork
Sycamore
Dog Fork
Old Home Br
Whiskey Hollow
Bear Water Br
Beech Fk
MARTIN CO
JOHNSON CO
FLOYD
Upper Daniels Cr
Odds
Stonecoal
Gas Well

Greg McKinney
Testimony

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

MATRIX ENERGY, LLC	)	
FOR DETERMINATION OF	)	**CASE NO. 2003-00228**
RETAIL ELECTRIC SUPPLIER	)	

PREPARED TESTIMONY OF GREGORY L. McKINNEY ON BEHALF OF BIG SANDY RURAL ELECTRIC COOPERATIVE CORPORATION

****

Q. Please state your name and business address.

A. My name is Gregory L. McKinney and my business address is 4775 Lexington Road, Winchester, Kentucky 40391.

Q. What is your educational background?

A. I have a Bachelor of Science in Electrical Engineering from the University of Kentucky. I am a licensed Professional Engineer in the State of Kentucky.

Q. By whom are you employed and what is your job title and duties?

A. I am employed by East Kentucky Power Cooperative ("EKPC"). My job title is Senior Engineer. My primary responsibilities center around distribution and transmission planning activities. I work closely with EKPC's Member Systems to assess the need and justification for adding distribution substation capacity to the transmission grid.

Q. Would you summarize the events regarding East Kentucky Power Cooperative and a proposed new coalmine in Johnson County, which has become known as the "Matrix Mine"?

A. On January 3, 2002, BS/EKPC met with Beechfork at BS's office to discuss service to new coal mining facility in Johnson County. The electrical demand was estimated to be between 5-10 MW. At that meeting, Beechfork requested permanent electrical service in January 2003 from BS. On February 15, 2002, EKPC met with American Electric Power ("AEP") in Columbus, OH to discuss transmission service for the new coal mining facility. On February 25, 2002, EKPC received updated load requirements from Beechfork's Paul Horn indicating the projected load to be substantially less than originally anticipated. The new loading numbers start at 2.1 MW for the first year-and-a-half and grow to 3.3 MW thereafter. On March 25, 2002, EKPC made a formal written request to AEP for a System Impact Study ("SIS") to determine the impact of adding the Beechfork load to the AEP system. On April 15, 2002, BS/EKPC met with Beechfork at BS's office and presented a preliminary plan for serving the load. The plan included a 1.6-mile, 69 kV line tapping AEP's 69 kV system, and a temporary 69-12.5 kV, 5.6 mVA substation. Beechfork agreed in principal to a 5-year contract designed to pay back EKPC/BS for all incurred transmission costs. These estimated transmission costs included $267,000 for the 1.6 mile, 69 kV transmission line and all costs associated with EKPC establishing a 69 kV interconnection with AEP. To help minimize these costs, Beechfork agreed to grant EKPC all necessary right-of-way easements and prepare the substation site to EKPC specifications. All parties agreed to proceed with preliminary design and the necessary AEP studies. On that same day after the office meeting, EKPC design engineers met with Beechfork representatives in the field and located the substation site and a preliminary 69 kV line route. On April 22, 2002,

EKPC executed a SIS Agreement with AEP requesting them to study a new 69 kV interconnection to serve the Beechfork load. Along with that executed agreement, EKPC made a deposit in the amount of $5,000 to cover one-half the estimated cost of the SIS. On June 3, 2002, EKPC received AEP's written SIS report that indicated very little impact to the AEP system. On June 18, 2002, EKPC received a formal letter from AEP requesting EKPC to execute a Facilities Study Agreement ("FS") and $10,000 refundable deposit to cover one-half the estimated cost of the FS. On June 20, 2002, EKPC executed the FS Agreement with AEP and paid the required $10,000 deposit. On July 24, 2002, engineers from AEP and EKPC met on-site, as a part of the FS, to scope out facility requirements. On August 21, 2002, EKPC received AEP's written FS report indicating that EKPC would be responsible for a contribution in aid of construction in the amount of $332,000 plus all expenses associated with operating and maintaining the direct interconnection facilities. This estimate was based on an in-service date of February 2003. On September 5, 2002, EKPC emailed Beechfork, at Beechfork's request, cost estimates for two different substation locations; the original site located 1.6 miles from AEP's line and substation site located adjacent to AEP's 69 kV line. Beechfork was to evaluate options and notify BS/EKPC of which option to pursue. On October 31, 2002, AEP sent an invoice to EKPC for the amount of $6,454.47 to cover the remaining costs of the SIS and FS. On November 7, 2002, EKPC mailed a check in the amount of $6,454.47 to AEP, bringing the total paid to AEP for SIS and FS to $21,454.47.

Q. In the meeting of 1/3/02 was there discussion regarding the time schedule for providing the electric service to Beechfork (Matrix)? If so, what was the discussion?

A. Yes. Beechfork (Matrix) indicated that it needed permanent power from Big Sandy RECC within approximately one year.

Q. Why was it decided to obtain transmission service from AEP?

A. The transmission tap line from EKPC 69 kV system would be in the 4-5 mile range depending on routing. EKPC and Big Sandy did not want to burden private property owners with this facility to serve only one customer for a period of 8-10 years. EKPC did not want to duplicate transmission facilities. AEP has a 69 kV line and a 138 kV line on the Beechfork property capable of serving this load. Beechfork was agreeable to granting EKPC the necessary right-of-way easements and substation site. All necessary easements and substation site were contained on Beechfork property.

Q. Also, at the 1/3/02 meeting was there a discussion regarding a temporary for the purpose of construction?

A. I cannot recall any discussions of temporary service.

Q. Would you comment on the testimony of Paul Horn in response to Question No. 18, concerning the location and capacity of the substations and permitting construction of the lines and substations by Matrix?

A. In the initial meeting with Beechfork Paul Horn requested service at 12.47/7.2 kV. To my knowledge, he never requested nor inquired about service at 34.5 kV. Nor did he ever inquire about the possibility of Beechfork constructing and owning the distribution substation. I never suggested or recommended moving the distribution substation adjacent to AEP's 69 kV line. I basically brought that option up to Paul

Horn so that he could evaluate it and compare its cost with the option of constructing the substation 1.6 miles away from AEP's 69 kV line. Paul Horn seemed interested in this new option and stated that he would in fact evaluate it and get back with me on which way to proceed. That was my last conversation with Paul Horn and that was in September 2002. EKPC and Big Sandy can provide the same source voltage and offer the same flexibilities to Beechfork that Paul Horn is claiming AEP has offered to Beechfork. EKPC and Big Sandy never discussed these options and flexibilities with Beechfork because we were continually encouraged by Beechfork to proceed with the 1.6 mile, 69 kV Tap from AEP and the 69-12.47 kV Substation.

Q. Would you comment on Paul Horn's answer in paragraph No. 23 regarding Safety benefits if AEP provides the electric service to Matrix?

A. Regardless if there is a single service provider or a dual service provider, blackouts and/or brownouts caused by problems on AEP's transmission system would be responded to in the same manner by AEP. Under AEP's Open-Access Transmission Tariff ("OATT"), AEP is required to provide the same level of service to its non-native, firm loads as it does to its native loads. Therefore, AEP will be able to detect and troubleshoot any problem on its transmission system and bring the Beechfork load back on in the same timely manner, regardless if the Beechfork load is an AEP load or a Big Sandy load. Beechfork will not have to wait for Big Sandy to contact EKPC, and then EKPC to contact AEP to inform it of the problem, determine the cause of the problem and to solve the problem.

Q. Would you comment on Paul Horn's answer in paragraph No. 24 regarding Duplication of lines and facilities?

A. Paul Horn has assumed that only AEP can provide him with 34.5 kV service and only AEP will construct or allow Beechfork to construct 34.5 kV to the boreholes. The fact of the matter is, EKPC/Big Sandy could and would be willing to supply 34.5 kV service to the entrance of the mine as well as to the boreholes. There is absolutely no reason that I can think of for duplication of facilities regardless if the load is served from one provider or two providers. Either company at whatever voltage requested by Beechfork can provide the same transmission and substation facilities. Furthermore, each company, to allow for one company to serve the mine entrance and one company to serve the boreholes, can share common transmission and substation facilities.

Q. How soon could EKPC have electric service at 34.5 kV to the Matrix mine Entrance?

A. EKPC and Big Sandy can provide 34.5 kV service to the mouth of the mine in approximately 6 months, assuming AEP and EKPC can establish an interconnection agreement without delays.

Q. What is EKPC's plan to provide 34.5 kV service from the interconnection to the mine entrance?

A. EKPC would make a voltage transformation from 69 kV to 34.5 kV either adjacent to AEP's 69 kV line or at the mine entrance, whichever Beechfork prefers. If Beechfork prefers the substation to be located at the mine entrance, EKPC would be required to build a 1.6 mile 69 kV line from AEP's 69 kV line. Once that decision is made, the next question is where does the change of ownership take place. 34.5 kV lines can be

constructed from the 69-34.5 kV substation to different locations (entrance, boreholes, etc), as required by Beechfork. EKPC/Big Sandy can own the 34.5 kV feeders or Beechfork can own the 34.5 kV feeders.

Q. While working on this project with Beechfork, were there ever any discussions about territory disputes, service from AEP, 34.5 kV service for the mining equipment, or boreholes?

A. I have not had any discussions with Beechfork regarding possible territorial disputes, service from AEP, kV requirements or boreholes. From the very beginning, we were to provide them with 12.5 kV service adequate for serving approximately 3,000 kW. EKPC was to construct a 69-12.5 kV substation, with Beechfork building 12.5 kV lines out of that substation to serve various machinery.

Q. Will you file a copy of the "SIS" and "FS" studies as exhibits (marked for *Identification* as Big Sandy Ex. 3 and 4, respectively) and make them part of our testimony in this case?

A. Yes. Please see Big Sandy Exhibit 3 and Big Sandy Exhibit 4 for the System Impact Study and Facilities Study, respectively, that were prepared by AEP.

Q. Does this conclude your testimony?

A. Yes.

Gregory L. McKinney

Gregory L. McKinney

STATE OF KENTUCKY

COUNTY OF JOHNSON

SUBSCRIBED AND SWORN to and acknowledged before me Greg McKinney, this the 23rd day of October 2003.

My Commission expires: July 21, 2003

NOTARY PUBLIC, STATE AT LARGE

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the foregoing was mailed, first class postage prepaid to the following on October 23, 2003:

Mark R. Overstreet, Esq.
Stites & Harbison, PLLC
421 W. Main Street
P O Box 634
Frankfort KY 40602-0634

Robert C. Moore, Esq.
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415 W. Main Street, 1st Floor
P O Box 676
Frankfort KY 40602-0676

Albert A. Burchett
Attorney for Big Sandy RECC
P O Box 0346
Prestonsburg KY 41653

System Impact Study
Power Flow Analysis and
Short Circuit Analysis

East Kentucky Power Cooperative's
New Delivery Point "Beechfork"
Served from the AEP Transmission System

Johnson County, Kentucky

AEP Project # 4014

Transmission Planning

June 2002

AEP: America's Energy Partner™

1. INTRODUCTION

East Kentucky Power Cooperative (EKPC) by a letter dated April 23, 2002, requested American Electric Power (AEP) to conduct a limited scope power flow and short circuit analyses to evaluate the feasibility of establishing a new 69 kV delivery point "Beechfork" in Johnson County, Kentucky. The new delivery point will serve a potential coal mining facility, to be located approximately 1.6 miles south of the Dewey-Inez 69 kV line (See Figures 1, 2 and 3). EKPC proposes to establish the new delivery point by January 2003.

This report summarizes the results of power flow and short circuit analyses for the following scenario:

- The new delivery point established from the Dewey–Inez 69 kV line, approximately 1.8 miles from the Dewey Station. The proposed mining facility, with projected demand around 3 MW, is connected to the Dewey-Inez 69 kV line by a 1.6 miles long 69 kV line utilizing 266.8 kCM ACSR conductor.

2. OVERVIEW OF POWER SUPPLY FACILITIES NEAR THE PROPOSED DELIVERY POINT

The Dewey-Inez area 69 kV network serves a rural area with coal mining being the predominant industry. Principal sources to the 69 kV network are the Inez 138/69 kV, 50 MVA and the Dewey 138/69, 90 MVA transformers, connected together via a 14 miles long 69 kV line. Under normal system conditions, power flows from the Inez Station, a major point of electric power delivery to a large area spanning Johnson, Martin, Mingo and Pike Counties. Local area reactive support/voltage control is provided by the switched shunt capacitor banks installed at Inez and Dewey Stations, in addition to the Inez 138 kV, 160 MVA Unified Power Flow Controller (UPFC).

3. SCOPE OF STUDY

The scope of System Impact Study (SIS) is limited to assessing the feasibility of establishing the new delivery point using Power Flow and Short Circuit Analyses.

Power Flow Analysis: The scope of this study was to develop power flow base cases for the 2003 summer, 2004 summer, 2002/2003 winter and 2003/2004 winter periods, and conduct power flow analysis to determine possible thermal and voltage limits on the transmission system resulting from serving the proposed mining load. The study focused on evaluating the feasibility of establishing the new delivery point by tapping the Dewey-Inez 69 kV line.

Short Circuit Analysis: The scope of this study was to calculate short circuit fault levels at the proposed 69 kV Delivery Point and at the stations in the vicinity. The study also focused on a limited starting flicker voltage calculations at the point of connection between EKPC and AEP.

After reviewing this report, EKPC may request AEP to conduct a Facilities Study (FS) to identify the specific transmission facility additions/modifications and the associated cost that would be required to establish the proposed 69 kV Delivery Point from the AEP network. The FS will address any problems identified in the power flow and short circuit analyses.

It should be noted that the SIS and the FS only address the feasibility and the steps that must be taken to actually establish the new delivery point from the AEP System. However, these studies do not address the transmission service issues for supplying this load at the delivery point and/or the AEP/EKPC Interconnection Agreement requirements. A separate transmission service request must be made under the AEP's Open Access Transmission Tariff (OATT) regarding the provisions and rate(s) for delivery of energy to supply the load at the new delivery point.

Further, any network modifications made to address problems identified under either the power flow or short circuit analyses of the System Impact Study, may require a re-evaluation of the potential problems discovered in this part of the System Impact Study. Re-evaluations of any portion of the System Impact Study may also be needed if: 1) a different connection is desired by EKPC; 2) pending agreements between AEP and other entities are signed to build additional generation/transmission facilities in the general vicinity; or 3) significant transmission network changes occur within AEP or adjacent systems prior to the execution of "Interconnection Agreement" for the proposed delivery point addressed in this System Impact Study.

4. TESTING CRITERIA

In the steady state analysis, both linear and AC power flow studies were conducted to investigate the potential thermal and voltage impacts of the proposed new delivery point on the AEP transmission system. Since these impacts of the proposed delivery point addition on the local transmission system facilities are studied only for the initial year(s) of service, transmission margin needs to be provided to ensure the reliable delivery of electric power to continuously changing customer demands under a wide variety of system operating conditions. For a period of five to ten years into the future, a 10% transmission margin is applied by making adjustments to the transmission facility ratings. Consequently, 138 kV and lower voltage sub-transmission facility loadings greater than 90% of the applicable facility ratings are indicated in this report as possible areas of concern. For EHV facilities, the normal rating is used to assess normal and single-contingency outage performance, while the emergency rating is used for double-contingency outage conditions. EHV facility loading should be limited to 100% of the applicable rating.

As part of the Short Circuit Analysis, short circuit duties on the existing circuit breakers are investigated and compared with the asymmetrical interrupting capabilities as given by the breaker manufacturer and maintained in current AEP equipment databases.

5. POWER FLOW BASE CASE DEVELOPMENT

AEP's 2001 series of Base Cases were used as the starting point to develop power flow study cases. The 2003 summer, 2004 summer, 2002/2003 winter and 2003/2004 winter cases were utilized for the studies. These cases contain a detailed model of AEP's transmission and sub-transmission systems, as well as peak load forecast of the AEP system for the respective time periods. The Outside World (non-AEP System) model in this case was developed from the 2001 series of the NERC/MMWG 2002 summer and 2002/2003 winter cases. Third party transactions were not modeled as part of the study.

The load at the new delivery point was assumed at 2.1 MW (90% lagging power factor) and 3.3 MW (90% lagging power factor) for 2003 conditions and 2004 conditions, respectively. The study assumed the new load is located in EKPC's control area and is supplied from EKPC's own internal generation. Furthermore, the study only examined the connection of load at the new delivery point without any assessment to address the feasibility of transferring power from a specific designated unit to the load.

Facility ratings are lower during the summer season as compared to the winter season. In majority of the areas within the AEP Roanoke Transmission Region, the winter load levels are higher as compared to the corresponding levels in summer. Therefore, the power flow analysis was conducted for both summer and winter conditions.

6. AC POWER FLOW ANALYSIS AND RESULTS

Single and credible double contingency outages were simulated to evaluate the impact of the new delivery point on the AEP transmission and sub-transmission systems. Results of the AC power flow analysis for the projected 2002/2003 winter, 2003/2004 winter, 2003 summer and 2004 summer system conditions are discussed in the following sections:

6.1 – Dewey-Inez Area Existing System Conditions.

6.2 – New Delivery Point "Beechfork" Established off the Dewey-Inez 69 kV Line

6.1 Dewey-Inez Area Existing System Conditions

Power flows on the 69 kV transmission facilities in the Dewey-Inez Area are shown in Figures 4s & 5s (Summer Conditions) and Figures 6w & 7w (Winter Conditions). These power flow conditions are with all facilities in service and without the new "Beechfork" delivery point. In general, during both summer and winter peak load conditions, power flow directions are from the Inez 69 kV station towards Dewey 69 kV station.

The attached Tables 1-4 list the system conditions during normal, single contingency and credible double contingency outage conditions that were studied to evaluate the performance of the Dewey-Inez 69 kV area network for the summer and winter peak load conditions. The tables include ratings and loadings of critical transmission system facilities during each of the listed

system condition. The maximum power flow over the Dewey-Inez 69 kV line into the Dewey 138 kV bus is limited by the reverse power flow relay setting of 43 MVA.

The study results indicate that during peak load conditions and under normal, single contingency or credible double contingency outages, the loading on all critical facilities would remain within their respective capabilities. In addition, bus voltages, during the tested conditions, are found to remain within the desired limits. The exceptions are the loading on the Inez 138/69 kV, 50 MVA transformer and the Dewey-Inez 69 kV line during contingencies. Loading on both facilities – Inez transformer and the Dewey-Inez 69 kV line - - would be reduced to acceptable levels with the execution of the reverse power relay tripping of the Dewey 69 kV circuit breaker "A".

Facilities, which would load heavily during the conditions, are shown in Tables 1 - 4 and their maximum expected loadings based on the study assumptions are listed below:

Inez 138/69 kV, 50 MVA Transformer

Expected high loading during single contingencies:

71 MVA during summer (102 percent of Summer Rating), 78 MVA during winter (99% percent of Winter Rating).

The transformer loading would be reduced within the acceptable level with the tripping of Dewey 69 kV circuit breaker "A" triggered by reverse power relay setting. Application of this relay scheme limits the burden on the 69 kV network to support the 138 kV system.

Summer Normal Rating	**63 MVA**	**Winter Normal Rating**	**70 MVA**
Summer Emergency Rating	**70 MVA**	**Winter Emergency Rating**	**78 MVA**

Inez-Inez S.S. Section of Dewey-Inez 69 kV Line

Expected high loading during single contingencies:

72 MVA during summer (75 percent of Summer Emergency Rating), 77 MVA during winter (68 percent of Winter Rating).

The Dewey-Inez 69 kV line loading would be reduced with the tripping of Dewey 69 kV circuit breaker "A" triggered by reverse power relay setting to prevent the overloading of Inez 138/69 kV transformer. Application of this relay scheme limits the burden on the 69 kV network to support the 138 kV system

Summer Normal Rating	**78 MVA**	**Winter Normal Rating**	**103 MVA**
Summer Emergency Rating	**96 MVA**	**Winter Emergency Rating**	**114 MVA**

The line capability is limited by 600 A switches at Inez S.S. Depending on the load at Inez S.S. and the Massey tap, the 336.4 kCM ACSR conductor on the 2.9 mile section of the Massey-Pevler line may be the most limiting element - - 75 MVA (Summer) and 94 MVA (Winter).

Dewey 138/69 kV, 90 MVA Transformer

Expected high loading during single contingencies:

42 MVA during summer (49 percent of Summer Emergency Rating), 51 MVA during winter (59 percent of Winter Rating).

Summer Normal Rating	**86 MVA**	**Winter Normal Rating**	**86 MVA**
Summer Emergency Rating	**86 MVA**	**Winter Emergency Rating**	**86 MVA**

The transformer capability is limited by the overload relay trip setting of 86 MVA. Other limiting elements are 300 MCM Cu. Riser (88 MVA for Summer Emergency, 105 MVA for Winter Emergency) and 69 kV, 600 A Switch (96 MVA for Summer Emergency, 114 MVA for Winter Emergency). The Dewey 138/69 kV, 90 MVA transformer has the rating of 112 MVA (Summer Emergency) and 122 MVA (Winter Emergency).

6.2 New Delivery Point "Beechfork" Established off the Dewey-Inez 69 kV Line

This scenario assumes that the proposed Beechfork delivery point is established between the Dewey and the Pevler Stations, off the Dewey-Inez 69 kV line. No other AEP transmission system additions were assumed in this study. EKPC's proposed load is modeled in EKPC's control area.

Figures 8s & 9s (Summer Condition) and Figure 10w and 11w (Winter Condition) show power flow patterns under the same corresponding system conditions as in Section 6.1, but with the proposed "Beechfork" delivery point. The Inez and the Dewey 138/69 kV transformers respond about 35 and 65 percent respectively to the load at the new delivery point. All facility loadings remain within their normal ratings and the bus voltages are maintained within the prescribed limits.

The information contained in Tables 1 - 4 provide a summary on the performance of Dewey-Inez area transmission system for the summer and winter peak load conditions with the proposed Beechfork delivery point. The study results indicate that the loading on the Inez 138/69 kV transformer and the Dewey-Inez 69 kV line, as shown in the Tables 1 – 4, would increase slightly. On the other hand, loading on the Dewey 138/69 kV transformer would reduce slightly. In any event, execution of the reverse power relay scheme at Dewey Station will reduce the transformer and the line loading to within their respective capabilities. Bus voltages, during the tested conditions, are found to remain within the desired limits.

In summary, the power flow study results indicate that there will be a slight increase in the transmission facility loadings but would be within the acceptable limits with the existing reverse relay scheme at the Dewey Station. The bus voltages, during the tested conditions, are expected to remain within the desired limits.

7. SHORT CIRCUIT ANALYSIS AND RESULTS

7.1 Short Circuit Model

The current AEP short circuit base case model was used as the starting point. The proposed Beechfork delivery point was modeled approximately 1.8 miles from the Dewey 69 kV bus, off the Dewey-Pevler 69 kV line section. The new mining facility was connected to the Dewey-Inez 69 kV line via a delta/wye configured 69/12 kV, 5 MVA transformer (Z = 7.19%) and 1.6 miles

of 69 kV, 266.8 kCM ACSR conductor line. In order to conduct a limited voltage flicker screening using short circuit analysis, startup power was assumed as 1 MW and 1 MVAr.

7.2 Short Circuit Results

The short circuit duties of the existing circuit breakers in the Dewey-Inez area are not expected to be impacted by the establishment of Beechfork delivery point. The station bus faults for the key stations in the area are shown in Table 5. Based on the available information, the starting voltage flicker at the Beechfork Tap is estimated as 0.2% from the nominal voltage (See Figure 12). EKPC is responsible for conducting detailed voltage flicker study, associated with the new delivery point, to ascertain compliance to AEP's guidelines.

8. SUMMARY AND CONCLUSION

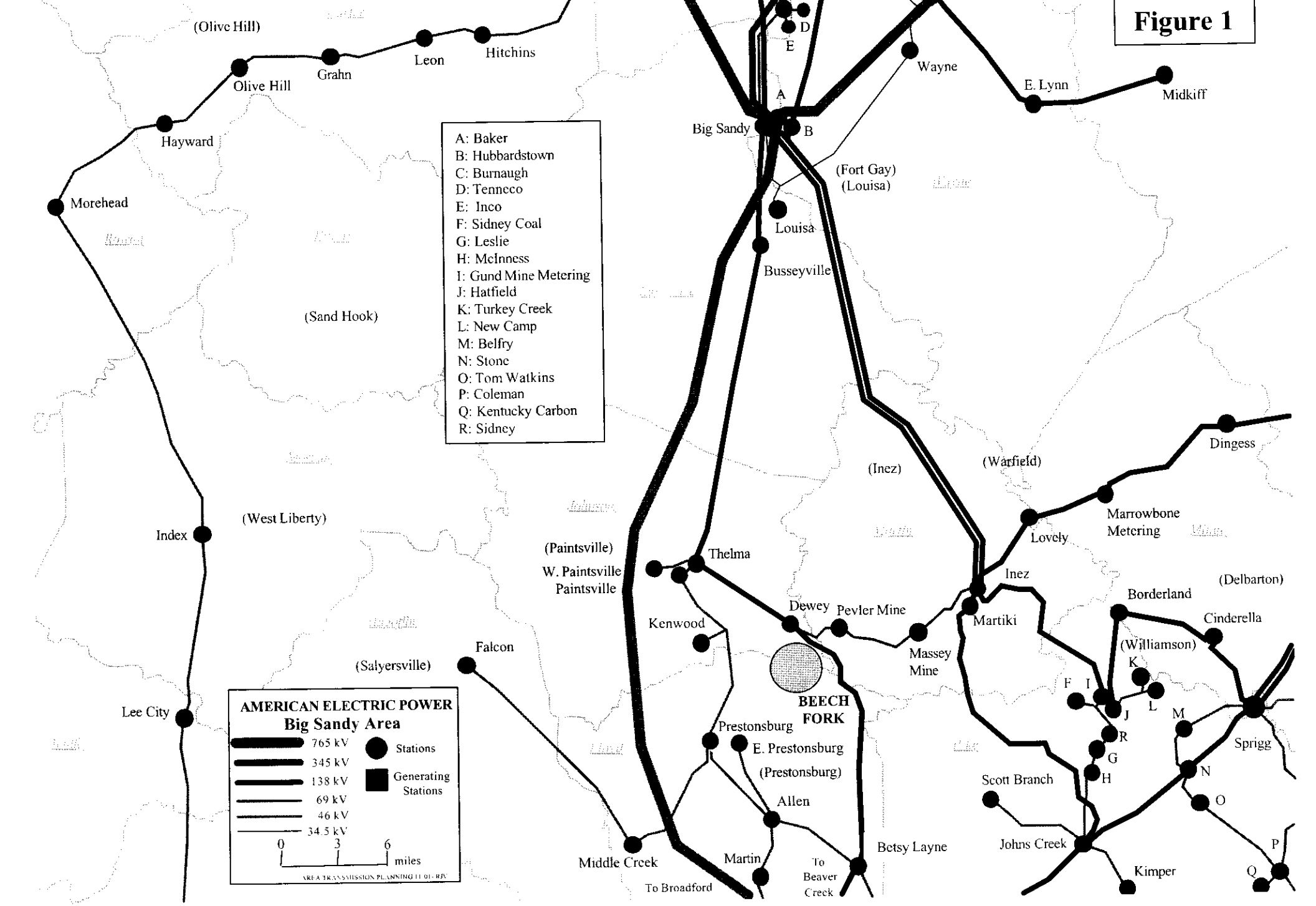
1) A System Impact Study was conducted to assess the feasibility of establishing a new delivery point that will serve a coal mining load. This study did not address the Transmission Service Interconnection Agreement requirements. A separate transmission service request must be made under the AEP's Open Access Transmission Tariff (OATT) regarding the feasibility and rate(s) provisions for delivery of energy to supply the load at the new delivery point.

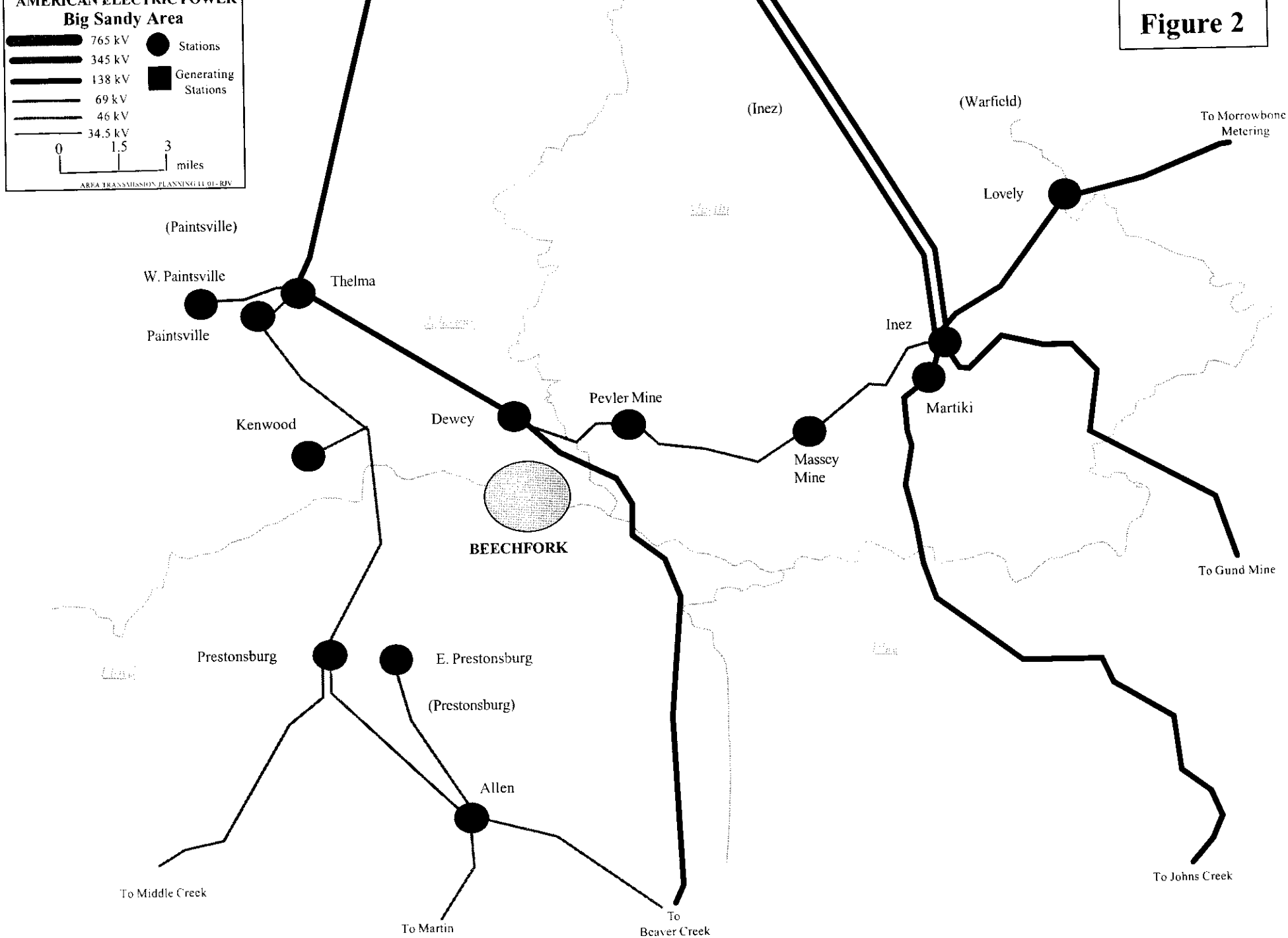
2) Tables 1 - 4 provides a summary on the loading of Dewey-Inez Area key facilities during 2003 summer, 2004 summer, 2002/2003 winter and 2003/2004 winter peak load conditions.

3) Establishment of the 'Beechfork" delivery point to serve the projected mining load would result in a slight increase in base, single, and credible double contingency transformer and line loadings. Appropriate adjustment/modification to the reverse power relay setting on the Dewey 138/69 kV transformer would be required and will be addressed in FS.

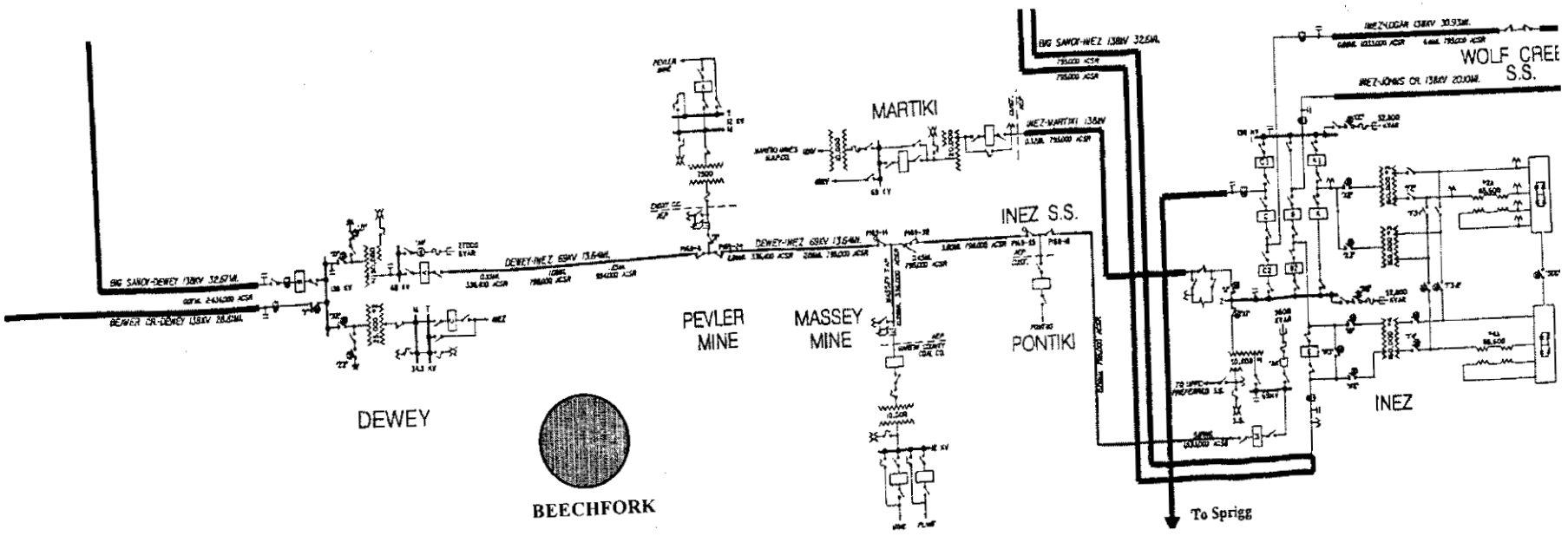
4) The short circuit study provided a limited assessment on the voltage flicker resulting from the startup of mining motor load. EKPC will have to comply with the AEP's voltage flicker requirements at the point of compliance – the Beechfork 69 kV Delivery Point. Also, the short circuit duties of the existing circuit breakers in the Dewey-Inez area, are not expected to be impacted by the establishment of Beechfork delivery point.

Figure 1

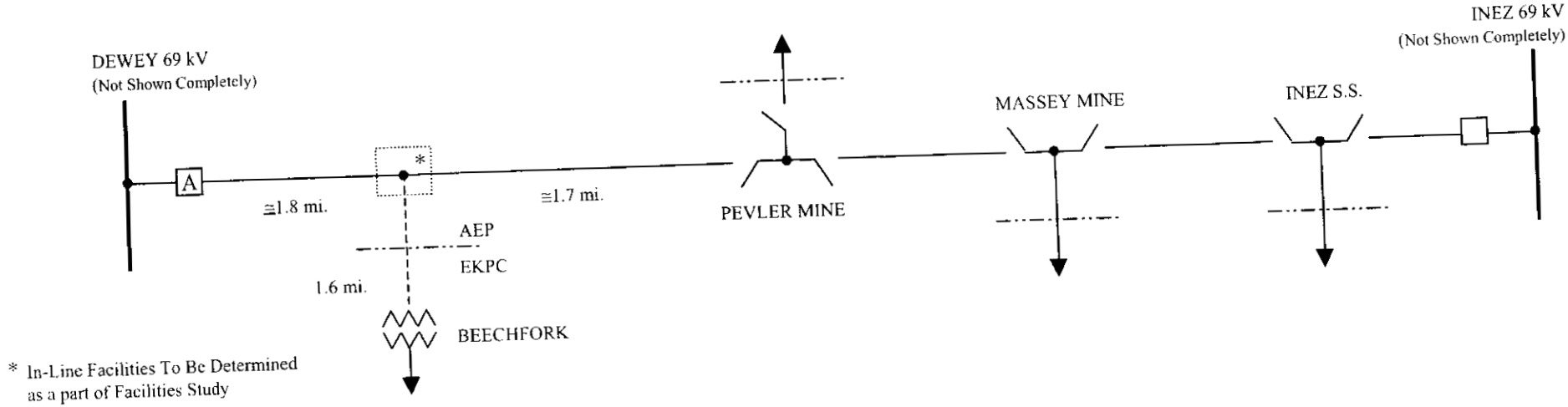

(Olive Hill)
Hitchins
Leon
Grahn
Olive Hill
Hayward
Morehead
(Sand Hook)
(West Liberty)
Index
Lee City
(Salyersville)
Falcon
(Paintsville)
W. Paintsville
Paintsville
Thelma
Kenwood
Dewey
Pevler Mine
Massey Mine
BEECH FORK
Prestonsburg
E. Prestonsburg
(Prestonsburg)
Allen
Martin
Middle Creek
To Broadford
To Beaver Creek
Betsy Layne
Big Sandy
A
B
D
E
Wayne
E. Lynn
Midkiff
(Fort Gay)
(Louisa)
Louisa
Busseyville
(Inez)
(Warfield)
Dingess
Marrowbone Metering
Lovely
Inez
Martiki
(Delbarton)
Borderland
Cinderella
(Williamson)
K
F
I
L
J
M
R
G
H
N
O
P
Sprigg
Scott Branch
Johns Creek
Kimper
Q
A: Baker
B: Hubbardstown
C: Burnaugh
D: Tenneco
E: Inco
F: Sidney Coal
G: Leslie
H: McInness
I: Gund Mine Metering
J: Hatfield
K: Turkey Creek
L: New Camp
M: Belfry
N: Stone
O: Tom Watkins
P: Coleman
Q: Kentucky Carbon
R: Sidney
AMERICAN ELECTRIC POWER
Big Sandy Area
765 kV
345 kV
138 kV
69 kV
46 kV
34.5 kV
Stations
Generating Stations
0
3
6
miles


AMERICAN ELECTRIC POWER
Big Sandy Area
765 kV
345 kV
138 kV
69 kV
46 kV
34.5 kV
Stations
Generating Stations
0
1.5
3
miles
AREA TRANSMISSION PLANNING 11-01-RJV
Figure 2
(Paintsville)
W. Paintsville
Paintsville
Thelma
Kenwood
Dewey
Pevler Mine
Massey Mine
(Inez)
(Warfield)
To Morrowbone Metering
Lovely
Inez
Martiki
BEECHFORK
To Gund Mine
Prestonsburg
E. Prestonsburg
(Prestonsburg)
Allen
To Middle Creek
To Martin
To Beaver Creek
To Johns Creek

Dewey – Inez 69 kV Line

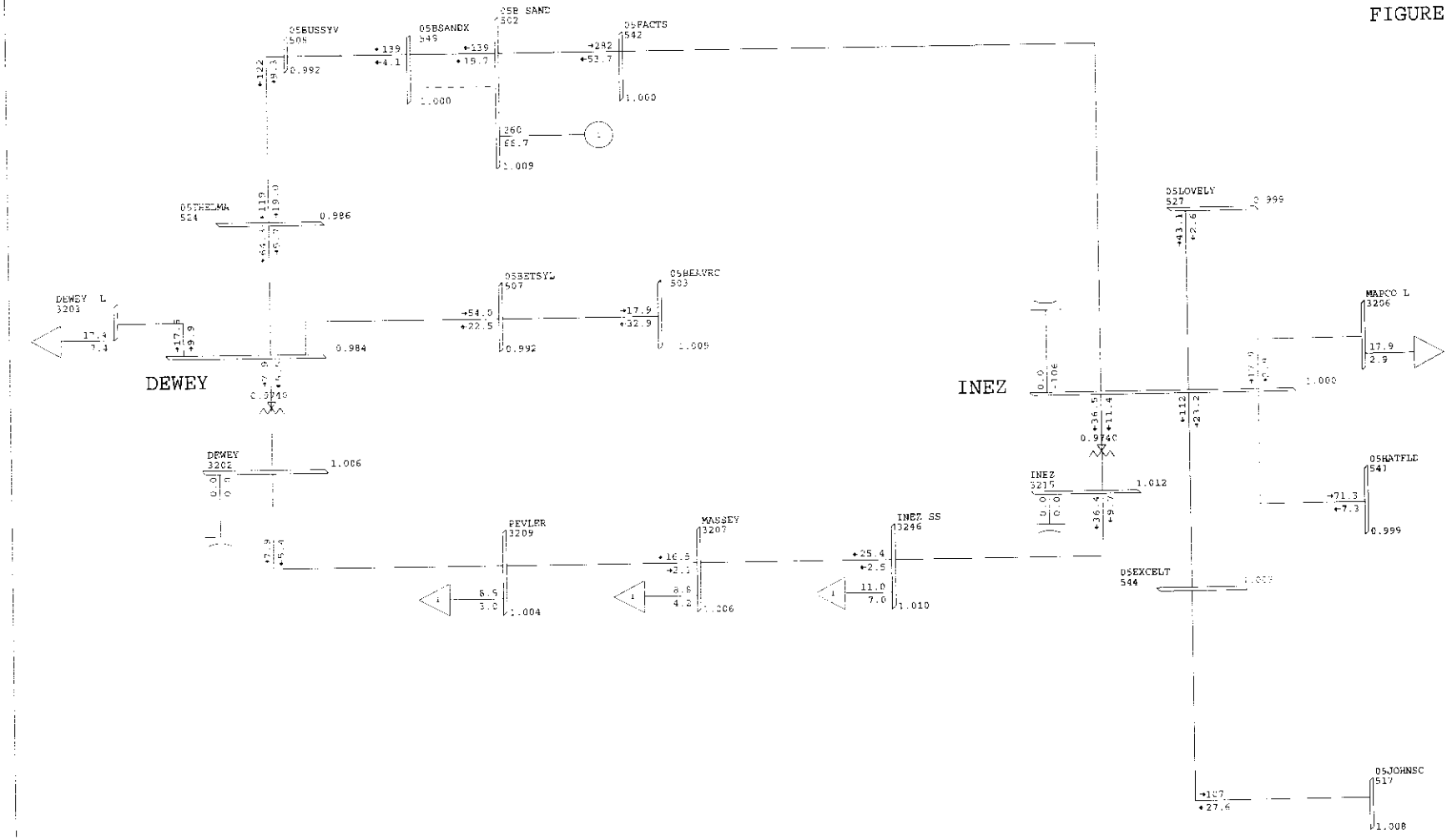


SIMPLIFIED DEWEY – INEZ 69 kV LINE



* In-Line Facilities To Be Determined as a part of Facilities Study

FIGURE 4S

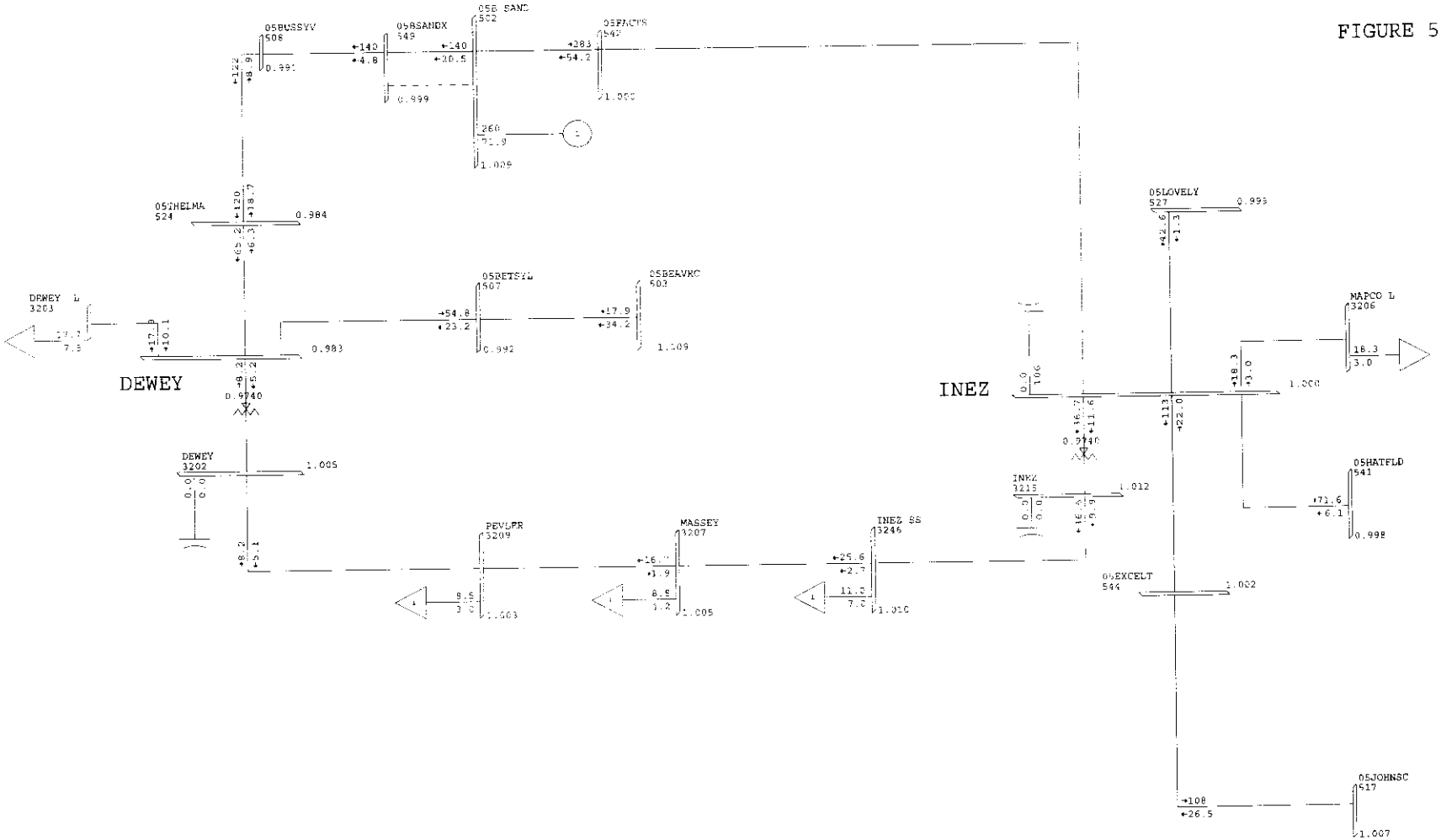


2002 SUMMER BCD FULL CASE (FINAL) - 2001 EDITION
UPDATED TO 2003S CONDITIONS W/O BF
FIGURE 4S THU, MAY 30 2002 8:58

90 % RATEB
0.950 UV 1.050 OV

BUS - VOLTAGE(PU)
BRANCH - MW/MVAR
EQUIPMENT - MW/MVAR

FIGURE 5S

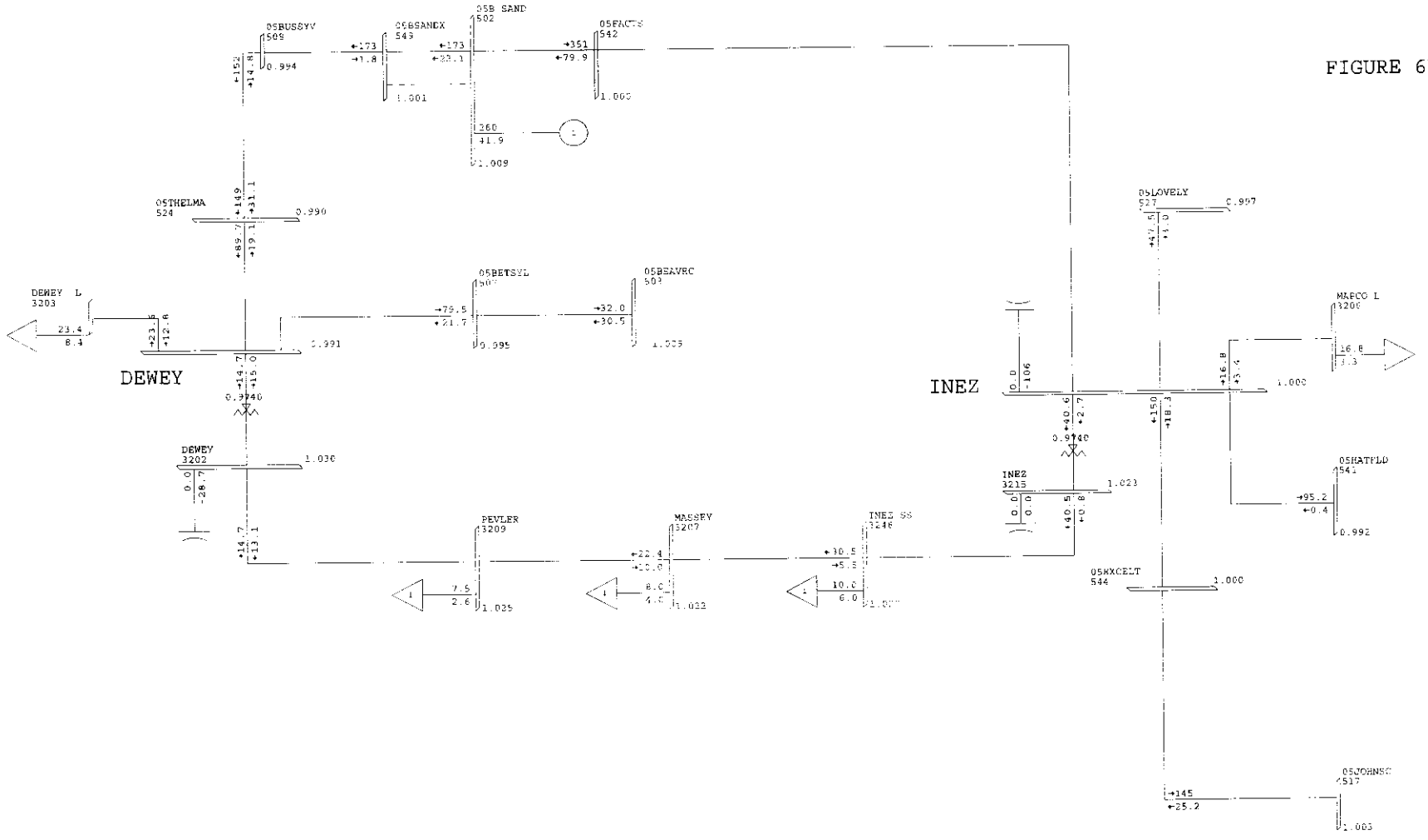


2002 SUMMER BCD FULL CASE (FINAL) - 2001 EDITION
UPDATED TO 2004 SUMMER CONDITIONS W/O BF
FIGURE 5S THU, MAY 30 2002 9:07

90 % RATEB
0.950 UV 1.050 OV

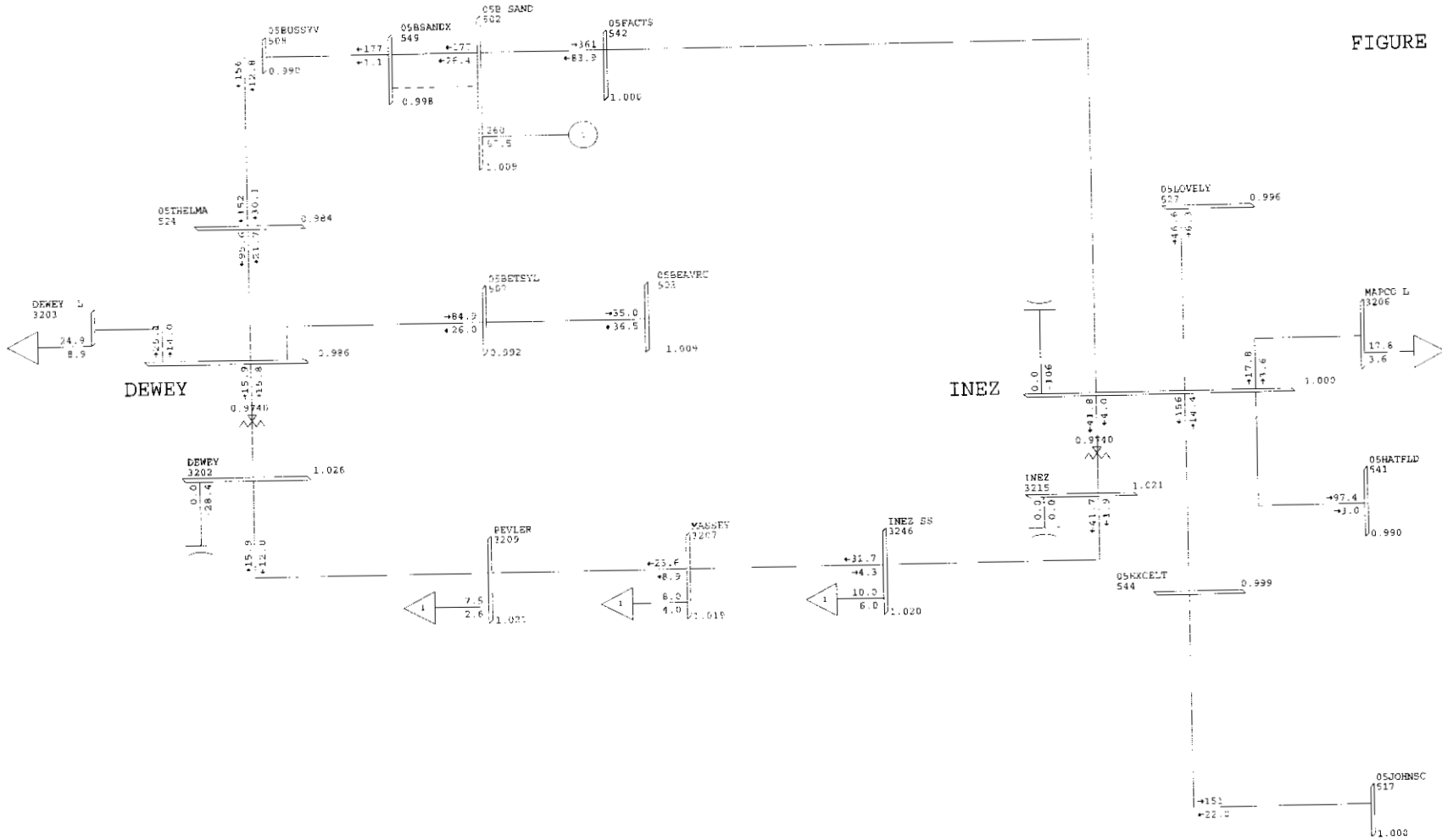
BUS - VOLTAGE(PU)
BRANCH - MW/MVAR
EQUIPMENT - MW/MVAR

FIGURE 6W



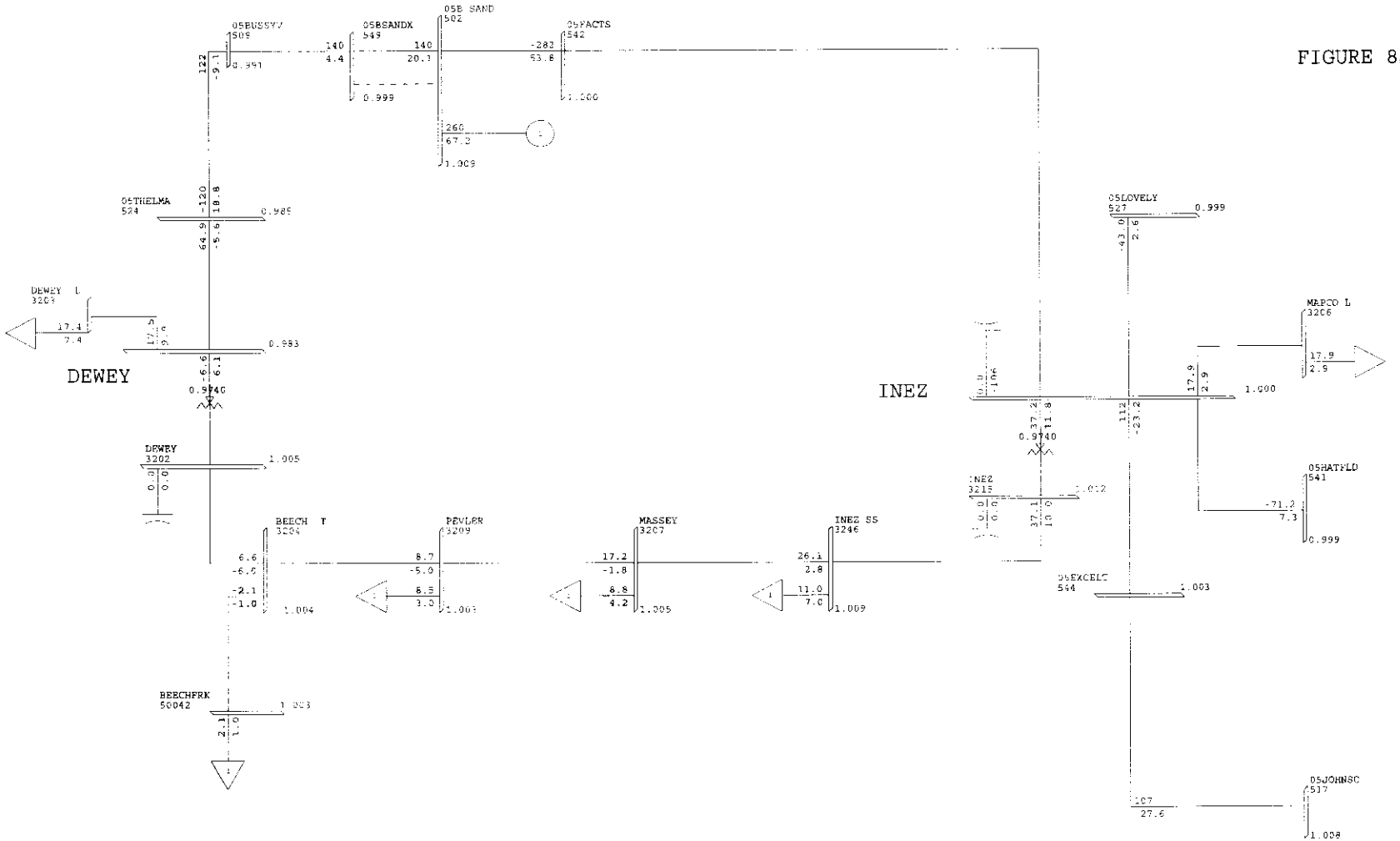
2001/02 WINTER BCD FULL CASE (FINAL) - 2001 EDITION UPDATED TO 2002/03W CONDITIONS W/O BF FIGURE 6W THU, MAY 30 2002 9:12	90 % RATEB 0.950 UV 1.050 OV	BUS - VOLTAGE(PU) BRANCH - MW/MVAR EQUIPMENT - MW/MVAR

FIGURE 7W



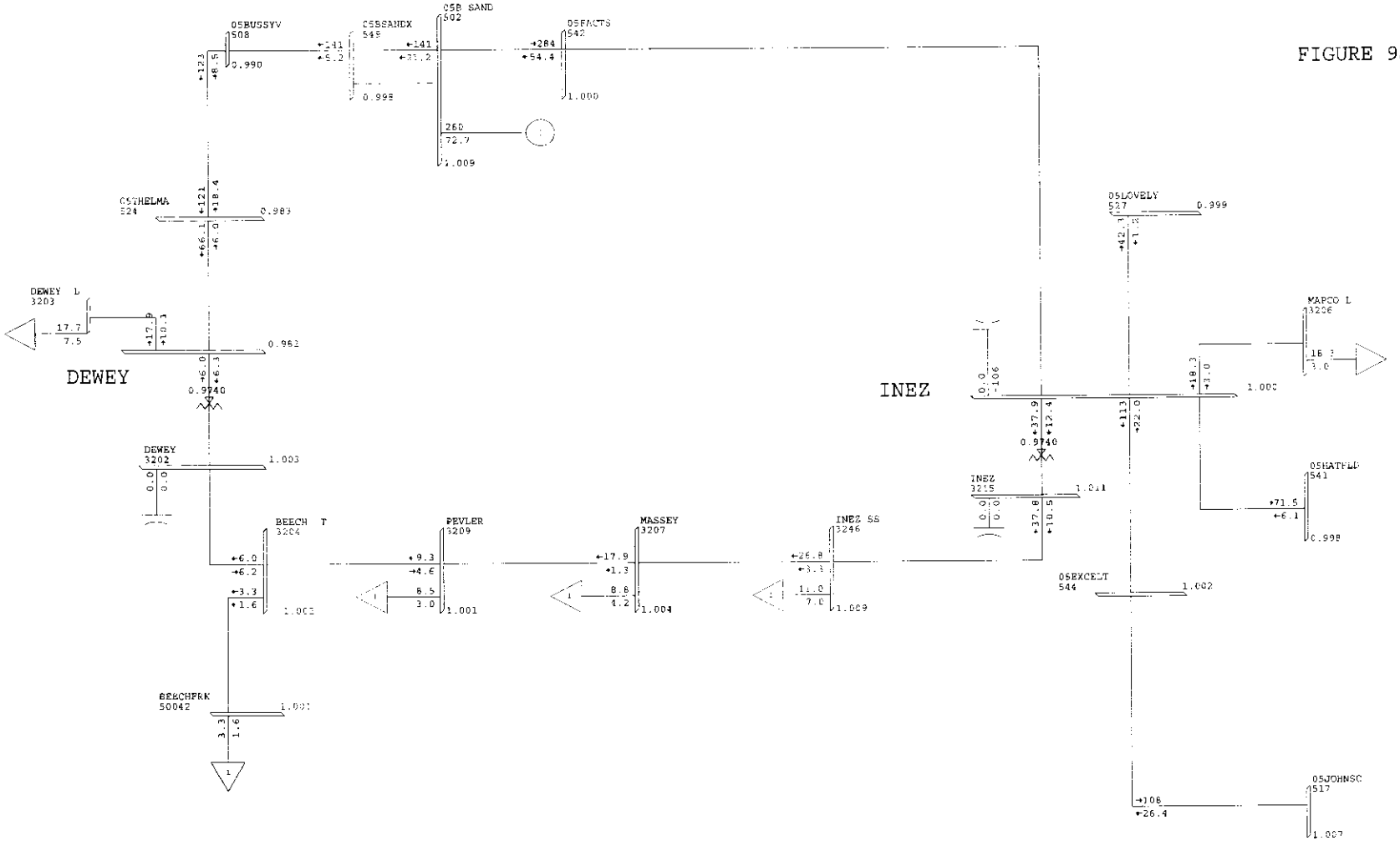
2001/02 WINTER BCD FULL CASE (FINAL) - 2001 EDITION UPDATED TO 2003/04W CONDITIONS W/O BF FIGURE 7W THU, MAY 30 2002 9:17		90 % RATEB 0.950 UV 1.050 OV	BUS - VOLTAGE(PU) BRANCH - MW/MVAR EQUIPMENT - MW/MVAR

FIGURE 8S



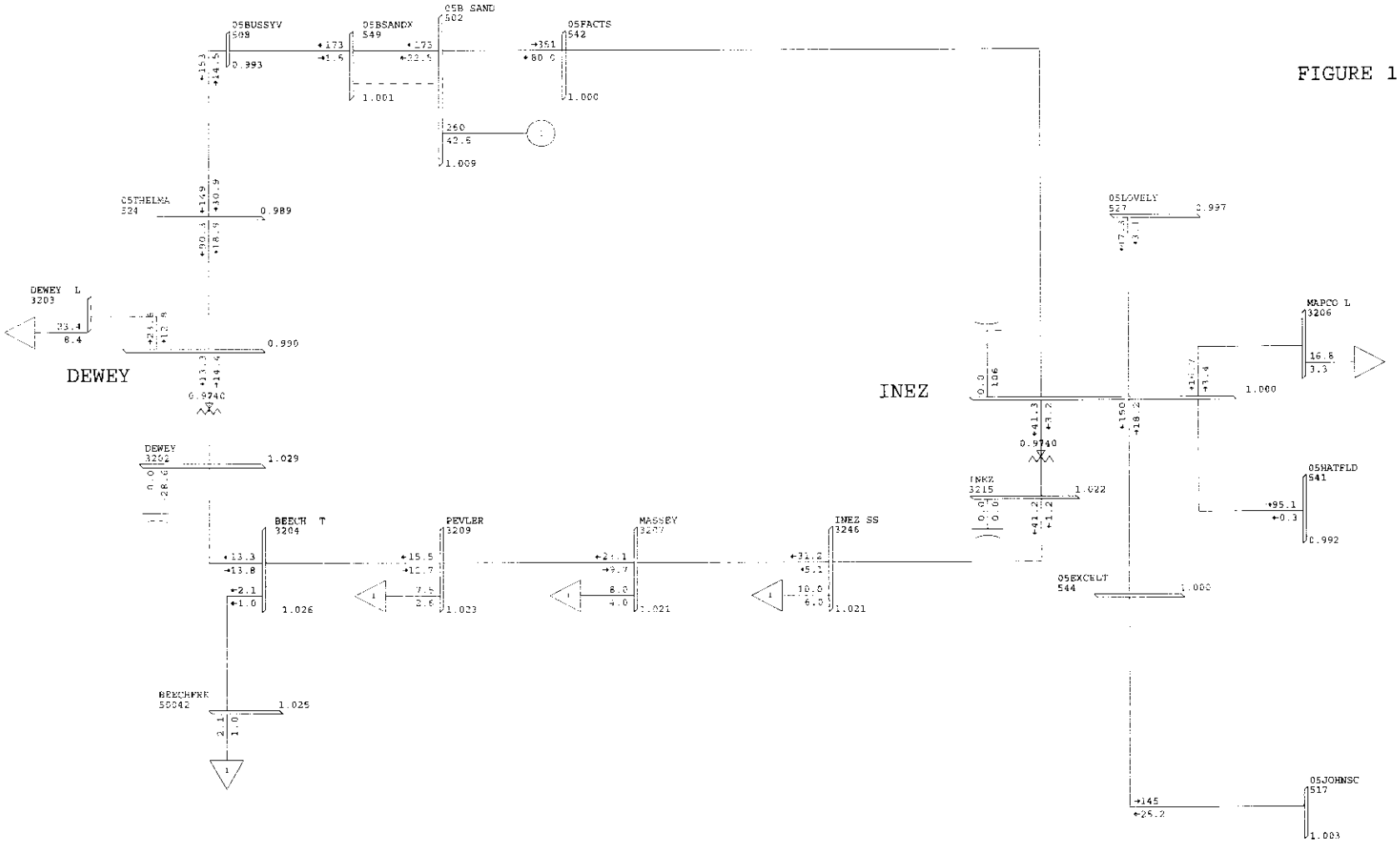
2002 SUMMER BCD FULL CASE (FINAL) - 2001 EDITION	90 % RATEB	BUS - VOLTAGE(PU)
UPDATED TO 2003S CONDITIONS (APCO\KPCO\KGPCO)	0.950 UV 1.050 OV	BRANCH - MW/MVAR
FIGURE 8S THU, MAY 30 2002 9:21		EQUIPMENT - MW/MVAR

FIGURE 9S



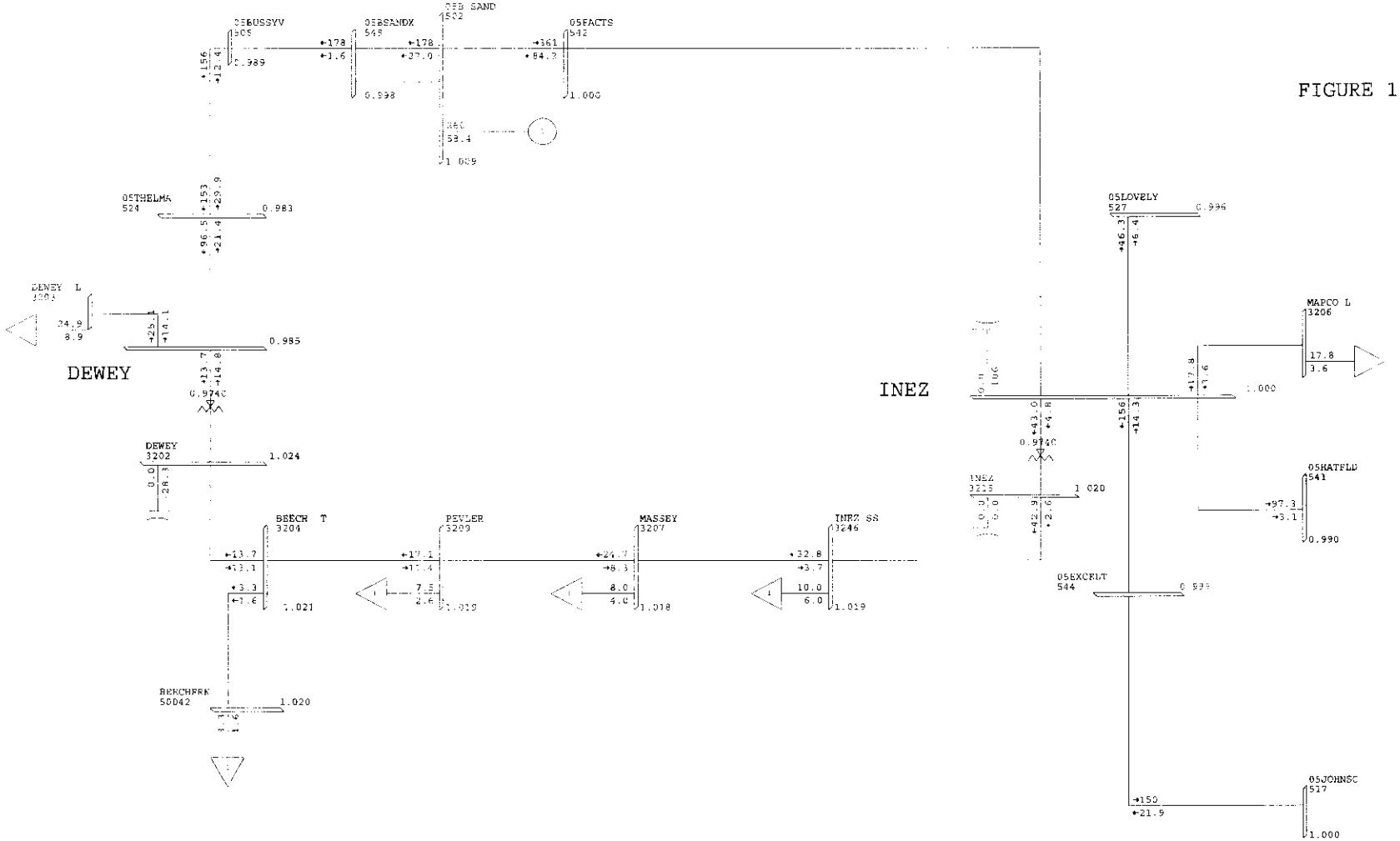
	2002 SUMMER BCD FULL CASE (FINAL) - 2001 EDITION UPDATED TO 2004 SUMMER CONDITIONS (APCO/KPCO/KGPCO) FIGURE 9S THU, MAY 30 2002 9:25	90 % RATEB 0.950 UV 1.050 OV	BUS - VOLTAGE(PU) BRANCH - MW/MVAR EQUIPMENT - MW/MVAR

FIGURE 10W



	2001/02 WINTER BCD FULL CASE (FINAL) - 2001 EDITION UPDATED TO 2002/03 WINTER CONDITIONS (APCO/KPCO/KGPCO) FIGURE 10W THU, MAY 30 2002 9:29	90 %_RATEB 0.950 UV 1.050 OV	BUS - VOLTAGE(PU) BRANCH - MW/MVAR EQUIPMENT - MW/MVAR

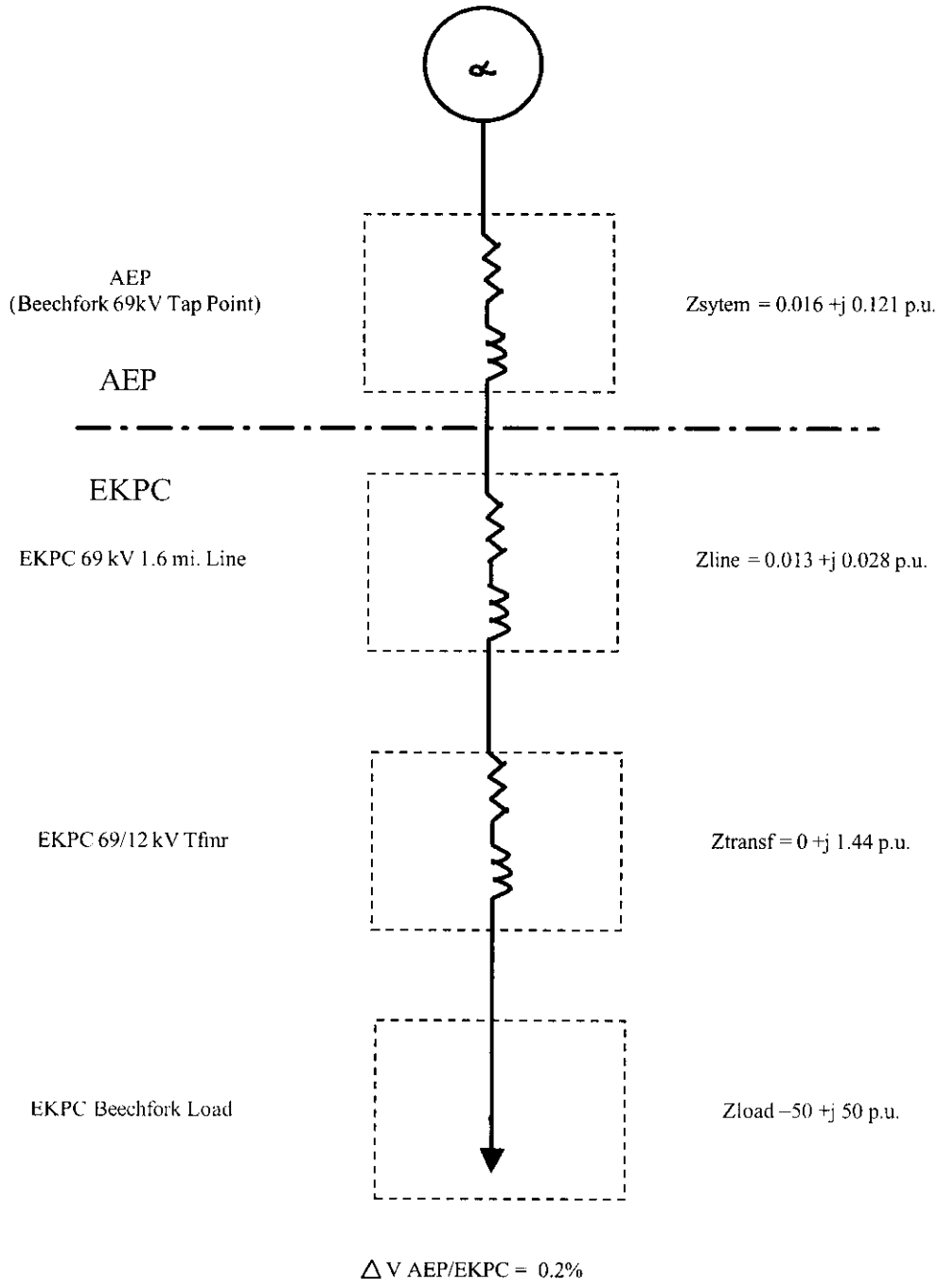
FIGURE 11W



2001/02 WINTER BCD FULL CASE (FINAL) - 2001 EDITION UPDATED TO 2003/04 WINTER CONDITIONS (APCO/KPCO/KGPCO) FIGURE 11W THU, MAY 30 2002 9:32	90 % RATEB 0.950 UV 1.050 OV	BUS - VOLTAGE(PU) BRANCH - MW/MVAR EQUIPMENT - MW/MVAR

Figure 12

EKPC'S New Delivery Point- Beechfork



NOTE : ALL IMPEDANCES IN PER-UNIT ON A 100 MVA BASE

Table 1 - (With and Without The Proposed EKPC's Beechfork Delivery Point - Beechfork Load 2.1 MW, 1.0 MVAr)

2003 Summer Peak Load Condition	Inez 138/69 kV Transformer		Dewey 138/69 kV Transformer		Big Sandy - Busseyville 138 kV Line		Massey - Pevler 69 kV Line		Inez SS - Massey 69 kV Line		Inez - Inez SS 69 kV Line		Pevler - Dewey 69 kV Line	Pevler - Beech Tap 69 kV Line	Beech Tap - Dewey 69 kV Line
Rating (SN/SE) in MVA	63 / 70		86 / 86		220 / 309		75 / 75		78 / 96		78 / 96		75 / 75	78 / 96	75 / 75
	Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA	Loading in MW/MVA	Loading in MW/MVA
	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	with BF Load
Base Condition - All Facilities in Service	36.5 / 38.2	37.2 / 39.0	7.9 / 9.6	6.6 / 8.9	139 / 139	140 / 140	16.5 / 16.6	17.2 / 17.3	25.4 / 25.5	26.1 / 26.3	36.4 / 37.6	**37.1 / 38.5**	7.9 / 9.6	8.7 / 10.0	6.6 / 8.9
	Loading in MVA		Loading in MVA		Loading in MVA		Loading in MVA		Loading in MVA		Loading in MVA		Loading in MVA	Loading in MVA	Loading in MVA
Big Sandy - Inez 138 kV Line Out	24.8	25.2	25.8	26.9	180.0	181.0	20.1	19.7	18.1	18.1	24.1	24.1	26.0	25.4	27.1
Big Sandy - Busseyville 138 kV Line Out (with rev. relay)	32.6	35.0	0.0	0.0			9.1	11.4	18.9	21.3	31.9	34.3	0.0	2.3	0.0
Big Sandy - Busseyville 138 kV Line Out (w/o rev. relay)	**71.2** [3]	**72.0** [3]	**41.7** *	**40.5** *			50.1	50.9	59.5	60.3	71.6	72.4	41.5	42.2	40.3
Dewey 138/69 kV Transformer Out	32.6	35.0			132.0	132.0	9.1	11.4	18.9	21.3	31.9	34.3	0.0	2.3	0.0
Inez - Excel 138 kV Line Out	62.3	**63.1** [1]	**33.7** *	**32.6** *	129.0	130.0	41.1	41.8	49.8	50.5	61.4	62.1	33.3	33.9	32.2
Big Sandy - Busseyville & Inez - Excel 138 kV Lines Out (with rev. relay)	32.6	35.0	0.0	0.0			9.1	11.4	18.9	21.9	31.9	34.3	0.0	2.3	0.0
Big Sandy - Busseyville & Inez - Excel 138 kV Lines Out (w/o rev. relay)	**89.1** [3]	**89.9** [3]	**59.0** [4] *	**57.7** [4] *			67.3	**68.0** [2]	76.8	77.5	**88.8** [2]	**89.5** [2]	58.5	59.1	57.2
Inez 138/69 kV Transformer Out			29.2	31.5	140.0	140.0	19.9	19.9	11.3	11.2	9.4	9.3	28.9	28.9	31.2

1 Loading Above Normal Rating

2 Loading Above 90 % of Emergency Rating

3 Loading Above Emergency Rating

4 Loading Above 43 MVA Reverse Relay Setting on Dewey 138/69 kV Transformer

* Power Flows from 69 kV towards 138 kV

Table 2

Table 2 - (With and Without The Proposed EKPC's Beechfork Delivery Point - Beechfork Load 3.3 MW, 1.6 MVAr)

2004 Summer Peak Load Condition	Inez 138/69 kV Transformer		Dewey 138/69 kV Transformer		Big Sandy - Busseyville 138 kV Line		Massey - Pevler 69 kV Line		Inez SS - Massey 69 kV Line		Inez - Inez SS 69 kV Line		Pevler - Dewey 69 kV Line	Pevler - Beech Tap 69 kV Line	Beech Tap - Dewey 69 kV Line
Rating (SN/SE) in MVA	63 / 70		86 / 86		220 / 309		75 / 75		78 / 96		78 / 96		75 / 75	78 / 96	75 / 75
	Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA	Loading in MW/MVA	Loading in MW/MVA
	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	with BF Load
Base Condition - All Facilities in Service	36.7 / 38.5	37.9 / 39.9	8.2 / 9.7	6.0 / 8.7	140 / 140	141 / 141	16.7 / 16.8	17.9 / 17.9	25.6 / 25.7	26.8 / 27.0	36.6 / 37.9	37.8 / 39.2	8.2 / 9.6	9.3 / 10.4	6.0 / 8.6
	Loading in MVA		Loading in MVA		Loading in MVA		Loading in MVA		Loading in MVA		Loading in MVA		Loading in MVA	Loading in MVA	Loading in MVA
Big Sandy - Inez 138 kV Line Out	25.1	25.8	26.0	27.7	182.0	182.0	20.3	19.7	18.5	18.5	24.4	25.1	26.2	25.3	27.9
Big Sandy - Busseyville 138 kV Line Out (with rev. relay)	32.6	36.5	0.0	0.0			9.1	12.7	18.9	22.7	31.9	35.7	0.0	3.7	0.0
Big Sandy - Busseyville 138 kV Line Out (w/o rev. relay)	**71.4** [3]	**72.7** [3]	**41.8** *	**39.8** *			50.3	51.4	59.7	61.0	71.8	73.1	41.6	42.7	39.6
Dewey 138/69 kV Transformer Out	32.6	36.5			133.0	133.0	9.1	12.7	18.9	22.7	31.9	35.7	0.0	3.7	0.0
Inez - Excel 138 kV Line Out	62.6	**63.9** [2]	**33.8** *	**32.1** *	130.0	131.0	41.3	42.4	50.1	51.2	61.7	62.9	33.5	34.4	31.8
Big Sandy - Busseyville & Inez - Excel 138 kV Lines Out (with rev. relay)	32.6	36.5	0.0	0.0			9.1	12.7	18.9	22.7	31.9	35.7	0.0	3.7	0.0
Big Sandy - Busseyville & Inez - Excel 138 kV Lines Out (w/o rev. relay)	**89.3** [3]	**91.1** [3]	**59.0** [4] *	**56.7** [4] *			67.4	**71.0** [2]	77.0	**79.5** [1]	**89.0** [2]	**90.7** [2]	58.6	63.3	60.8
Inez 138/69 kV Transformer Out			29.2	32.9	141.0	142.0	19.9	19.9	11.3	11.2	9.4	9.3	28.9	28.9	32.5

1 Loading Above Normal Rating

2 Loading Above 90 % of Emergency Rating

3 Loading Above Emergency Rating

4 Loading Above 43 MVA Reverse Relay Setting on Dewey 138/69 kV Transformer

* Power Flows from 69 kV towards 138 kV

Table 3 - (With and Without The Proposed EKPC's Beechfork Delivery Point - Beechfork Load 2.1 MW, 1.0 MVAr)

2002/03 Winter Peak Load Condition	Inez 138/69 kV Transformer		Dewey 138/69 kV Transformer		Big Sandy - Busseyville 138 kV Line		Massey - Pevler 69 kV Line		Inez SS - Massey 69 kV Line		Inez - Inez SS 69 kV Line		Pevler - Dewey 69 kV Line	Pevler - Beech Tap 69 kV Line	Beech Tap - Dewey 69 kV Line
Rating (WN/WE) in MVA	70 / 78		86 / 86		280 / 356		94 / 94		103 / 114		103 / 114		94 / 94	103 / 114	94 / 94
	Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA	Loading in MW/MVA	Loading in MW/MVA
	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	with BF Load
Base Condition - All Facilities in Service	40.6 /40.7	41.3 / 41.4	14.7 / 21.0	13.3 / 19.6	173 / 173	173 / 173	22.4 / 24.5	23.1 / 25.0	30.5 / 30.9	31.2 / 31.6	40.5 / 40.5	41.2 / 41.3	14.7 / 19.7	15.5 / 20.0	13.3 / 19.2
	Loading in MVA		Loading in MVA		Loading in MVA		Loading in MVA		Loading in MVA		Loading in MVA		Loading in MVA	Loading in MVA	Loading in MVA
Big Sandy - Inez 138 kV Line Out	14.5	14.8	38.9	39.4	224.0	225.0	19.5	18.9	13.8	13.4	14.3	14.6	26.7	26.0	28.0
Big Sandy - Busseyville 138 kV Line Out (with rev. relay)	29.1	31.6	0.0	0.0			8.0	10.3	17.0	19.3	28.7	31.0	0.0	2.3	0.0
Big Sandy - Busseyville 138 kV Line Out (w/o rev. relay)	**75.8** [2]	**76.3** [2]	**49.3** [4] *	**46.8** [4] *			57.9	58.3	65.5	65.7	75.6	75.6	51.1	51.7	50.2
Dewey 138/69 kV Transformer Out	29.1	31.6			173.0	173.0	8.0	10.3	17.0	19.3	28.7	31.0	0.0	2.3	0.0
Inez - Excel 138 kV Line Out	64.3	65.1	**37.4** *	**36.2** *	168.0	168.0	44.5	45.1	52.7	53.3	63.3	64.0	37.2	37.7	35.9
Big Sandy - Busseyville & Inez - Excel 138 kV Lines Out (with rev. relay)	29.1	31.6	0.0	0.0			8.0	10.3	17.0	19.3	28.7	31.0	0.0	2.3	0.0
Big Sandy - Busseyville & Inez - Excel 138 kV Lines Out (w/o rev. relay)	**95.8** [3]	**96.6** [3]	**66.9** [4] *	**65.5** [4] *			77.3	77.9	85.1	85.8	95.3	96.0	70.1	70.7	69.1
Inez 138/69 kV Transformer Out			35.9	36.3	182.0	183.0	18.0	16.0	10.8	9.7	10.2	9.9	25.6	24.9	27.1

1 Loading Above Normal Rating

2 Loading Above 90 % of Emergency Rating

3 Loading Above Emergency Rating

4 Loading Above 43 MVA Reverse Relay Setting on Dewey 138/69 kV Transformer

* Power Flows from 69 kV towards 138 kV

Table 4 - (With and Without The Proposed EKPC's Beechfork Delivery Point - Beechfork Load 3.3 MW, 1.6 MVAr)

2003/04 Winter Peak Load Condition	Inez 138/69 kV Transformer		Dewey 138/69 kV Transformer		Big Sandy - Busseyville 138 kV Line		Massey - Pevler 69 kV Line		Inez SS - Massey 69 kV Line		Inez - Inez SS 69 kV Line		Pevler - Dewey 69 kV Line	Pevler - Beech Tap 69 kV Line	Beech Tap - Dewey 69 kV Line
Rating (WN/WE) in MVA	70 / 78		86 / 86		280 / 356		94 / 94		103 / 114		103 / 114		94 / 94	103 / 114	94 / 94
	Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA		Loading in MW/MVA	Loading in MW/MVA	Loading in MW/MVA
	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	w/o BF Load	with BF Load	with BF Load
Base Condition - All Facilities in Service	41.8 / 42.0	43.0 / 43.2	15.9 / 22.4	13.7 / 20.2	177 / 177	178 / 178	23.6 / 25.5	24.7 / 26.1	31.7 / 31.9	32.8 / 33.0	41.7 / 41.7	42.9 / 42.9	15.9 / 19.9	17.1 / 20.5	13.7 / 19.0
	Loading in MVA		Loading in MVA		Loading in MVA		Loading in MVA		Loading in MVA		Loading in MVA		Loading in MVA	Loading in MVA	Loading in MVA
Big Sandy - Inez 138 kV Line Out	15.3	16.8	38.7	40.2	229.0	230.0	18.8	18.5	13.5	14.0	15.0	16.5	25.8	25.2	28.3
Big Sandy - Busseyville 138 kV Line Out (with rev. relay)	29.1	33.1	28.1	28.1			8.0	11.6	17.0	20.7	28.7	32.4	0.0	3.7	0.0
Big Sandy - Busseyville 138 kV Line Out (w/o rev. relay)	**77.5** [2]	**78.4** [3]	**51.0** [4] *	**48.4** [4] *			59.4	60.1	67.2	68.0	77.3	78.3	52.4	53.1	50.4
Dewey 138/69 kV Transformer Out	29.1	33.1			178.0	179.0	8.0	11.6	17.0	20.7	28.7	32.4	0.0	3.7	0.0
Inez - Excel 138 kV Line Out	65.3	66.3	**38.0** *	**35.9** *	173.0	174.0	45.2	46.0	53.5	54.4	64.2	65.1	37.8	38.5	35.6
Big Sandy - Busseyville & Inez - Excel 138 kV Lines Out (with rev. relay)	29.1	33.1	28.0	28.0			8.0	11.6	17.0	20.7	28.7	32.4	0.0	3.7	0.0
Big Sandy - Busseyville & Inez - Excel 138 kV Lines Out (w/o rev. relay)	**97.7** [3]	**98.7** [3]	**68.5** [4] *	**66.1** [4] *			78.8	79.6	86.8	87.7	97.1	98.1	71.5	72.2	69.5
Inez 138/69 kV Transformer Out			35.5	36.9	188.0	189.0	15.9	18.0	9.7	10.8	10.3	10.1	24.7	25.7	29.3

1 Loading Above Normal Rating

2 Loading Above 90 % of Emergency Rating

3 Loading Above Emergency Rating

4 Loading Above 43 MVA Reverse Relay Setting on Dewey 138/69 kV Transformer

* Power Flows from 69 kV towards 138 kV

SHORT CIRCUIT FAULT DATA

Station Name	Short Circuit Fault Level 3L-G (MVA)	L-G (MVA)
Dewey 69 kV	**896**	**912**
Beechfork 69 kV Tap	**821**	**748**
Pevler 69 kV	**774**	**663**
Beechfork 69 kV (High Side of Transformer)	**661**	**551**

Facilities Study

East Kentucky Power Cooperative's New Delivery Point "Beachfork" Served from the AEP Transmission System

AEP Project #4014

Johnson County, Kentucky

Transmission Planning

August 2002

AEP: America's Energy Partner℠

1. INTRODUCTION

Eastern Kentucky Power Cooperative (EKPC) by letter dated June 20, 2002, requested American Electric Power (AEP) to conduct a Facilities Study to ascertain transmission system facilities required and its cost to establish EKPC's proposed new 69 kV delivery point "Beechfork" from AEP's transmission network in Johnson County, Kentucky. The new delivery point, proposed to be in-service by February 2003, will serve a potential coal mining facility with a projected demand of 3 MW.

The proposed Beechfork delivery point will be established from AEP's Dewey-Inez 69 kV line, approximately 1.7 miles from the Dewey Station. The new mining facility is located approximately 1.6 miles south of the Dewey-Inez 69 kV line (See Figures 1, 2, and 3). In response to EKPC's earlier request, power flow and short circuit studies were conducted and the results forwarded to EKPC. This Facilities Study addresses the results of the earlier studies and serves to conclude the study phase of EKPC's new delivery point proposal.

2. OVERVIEW OF POWER SUPPLY FACILITIES NEAR THE PROPOSED SITE

The Dewey-Inez area 69 kV network serves a rural area with coal mining being the predominant industry. Principal sources to the 69 kV network are the Inez 138/69 kV, 50 MVA and the Dewey 138/69, 90 MVA transformers, connected together via a 14 miles long 69 kV line. Under normal system conditions, power flows from the Inez Station, a major point of electric power delivery to a large area spanning Johnson, Martin, Mingo, and Pike Counties. The switched shunt capacitor banks installed at the Inez and Dewey Stations, in addition to the Inez 138 kV, 160 MVA Unified Power Flow Controller (UPFC), provide local area reactive support/voltage control.

3. SCOPE OF STUDY

The scope of this Facilities Study is to determine the facilities and cost estimates required to establish EKPC's proposed Beechfork delivery point from the AEP transmission network, including facilities necessary to address facility overloads and circuit breaker interrupting duty conditions, if any, which were identified in the System Impact Study covering power flow and short circuit analyses.

Note: This study does not address the transmission service requirements for delivery of energy to supply the load at the new delivery point. EKPC is required to obtain the necessary transmission service through AEP Open Access Transmission Tariff (OATT).

The cost estimates include the following:

1. Interconnection Cost which detail the facilities required to directly establish EKPC's proposed delivery point from the AEP transmission network.

4. COST ESTIMATES

Figures 1 and 2 show the approximate location of the Beechfork delivery point in relation to AEP's transmission facilities in the Dewey-Inez area. Figure 3 shows a simplified one-line switching diagram of the new 69 kV station and proposed interconnection point to EKPC. The cost estimates for the interconnection facilities beyond this point that would be constructed, owned and operated by EKPC are not included. EKPC will construct a short 69 kV line from the new AEP 69 kV station to its plant facility.

EKPC will be responsible for a Contribution In Aid of Construction (CIAC) covering full cost of the facilities as described in this report including any tax consequences resulting from the CIAC. EKPC will also be responsible for the expenses associated with the operation and/or maintenance activities related to the direct interconnection facilities included in this report.

The following estimates for the direct interconnection facilities are based on a commercial service date of February 1, 2003:

New AEP 69 kV Station (New 69 kV Interconnection Station)
Install a new 69 kV switching station at a site provided by EKPC with three (3) 69 kV, 1200 A MOAB switches, 69 kV interconnection metering, station grading, station fence, control and communication facilities, etc. The MOAB switch towards Inez Station will be provided with loop switching capability.

Note: It is assumed that EKPC will provide access to the new station through a locked gate, well drained gravel road, land for the station and R-O-W if necessary. Meeting the service date will be contingent upon EKPC providing a survey by the end of September 2002. AEP will own and operate the new AEP 69 kV station facilities.

Total Estimated Cost for direct interconnection facilities: $332,000

No system upgrades will be required. The existing AEP System in the Dewey-Inez area is capable of serving EKPC's proposed delivery point with a projected demand of around 3 MW.

The estimates are preliminary in nature, as they were determined without detailed engineering and design studies. Estimated costs are based on February 2003 service date. The estimates include total AEP loaded costs (including Capital, Maintenance, and Removal costs). However, the estimates do not include any gross-up for taxes. To the extent that any contribution toward the above costs by EKPC is taxable income to AEP, EKPC would be required to contribute the gross-up total. EKPC will also be responsible for the expenses associated with the operation and/or maintenance activities related to the facilities included in this report.

An Interconnection Agreement is needed before construction could be started. AEP will make every reasonable effort to have all the facilities completed in time to conform to the requested service date of February 1, 2003, but does not guarantee the completion by desired service date.

If a request for service by a new customer or an Interconnection Agreement for a generating facility in the general vicinity is executed, or significant transmission network changes occur within AEP or adjacent systems prior to the execution of an Interconnection Agreement for this proposed new delivery point, or the assumptions and data used in the analyses change significantly, then this study may have to be re-examined to assess the impact of conditions which were not anticipated at the time of the study.

EKPC must obtain the necessary transmission service from AEP through the AEP Open Access Transmission Service (OATT) to deliver electric energy to this new delivery point from a designated source. This new delivery point will not be placed in service until such transmission service is secured.

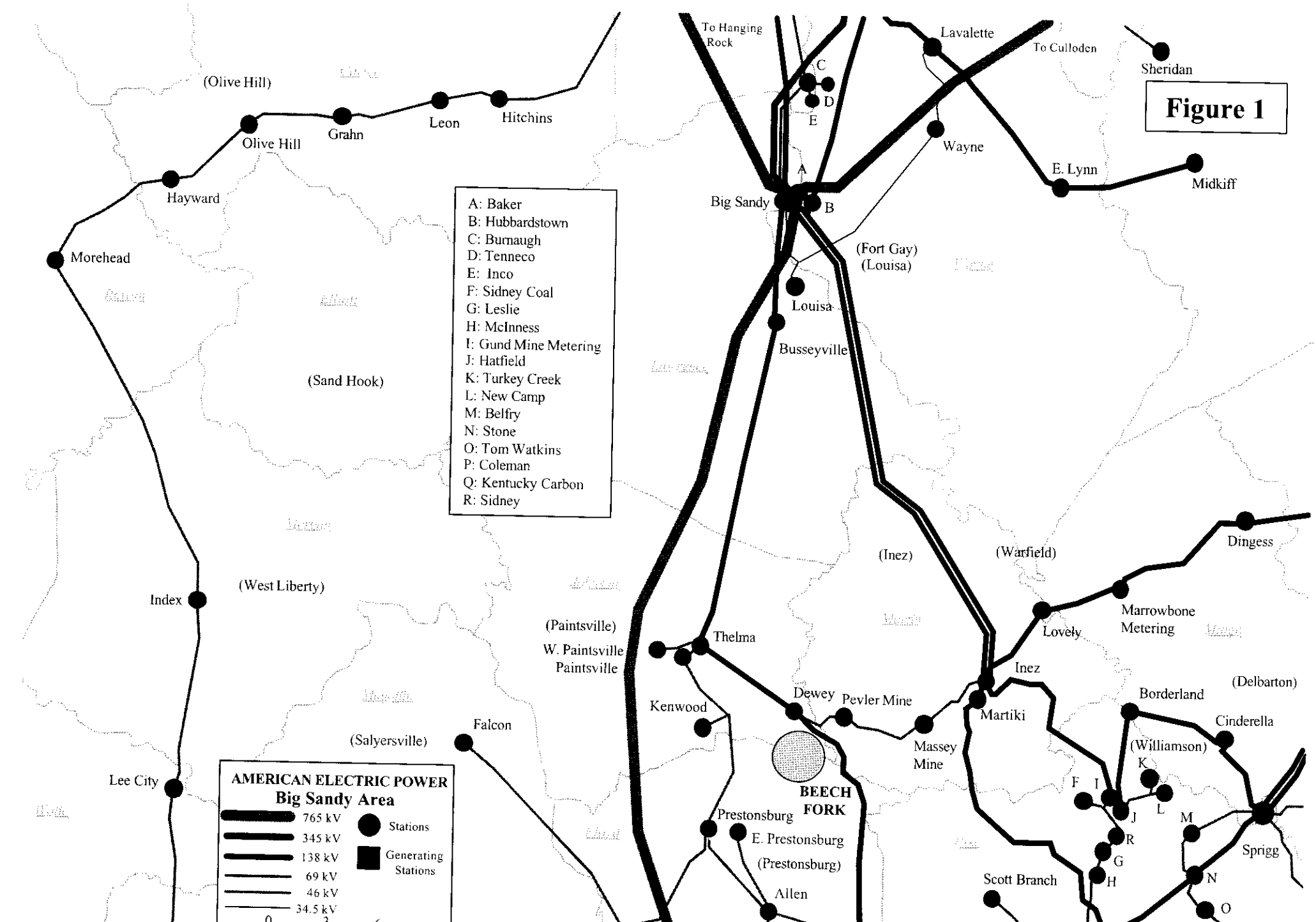


Figure 1
(Olive Hill)
Olive Hill
Grahn
Leon
Hitchins
Hayward
Morehead
(Sand Hook)
Index
(West Liberty)
Lee City
(Salyersville)
Falcon
(Paintsville)
W. Paintsville
Paintsville
To Hanging Rock
C
D
E
A
B
Big Sandy
Lavalette
To Culloden
Sheridan
Wayne
E. Lynn
Midkiff
(Fort Gay)
(Louisa)
Louisa
Busseyville
(Inez)
(Warfield)
Dingess
Marrowbone Metering
Lovely
Thelma
Kenwood
Dewey
Pevler Mine
Inez
Martiki
Massey Mine
BEECH FORK
Prestonsburg
E. Prestonsburg
(Prestonsburg)
Allen
Borderland
(Delbarton)
Cinderella
(Williamson)
K
F
I
L
J
M
R
G
H
N
O
Sprigg
Scott Branch
A: Baker
B: Hubbardstown
C: Burnaugh
D: Tenneco
E: Inco
F: Sidney Coal
G: Leslie
H: McInness
I: Gund Mine Metering
J: Hatfield
K: Turkey Creek
L: New Camp
M: Belfry
N: Stone
O: Tom Watkins
P: Coleman
Q: Kentucky Carbon
R: Sidney
AMERICAN ELECTRIC POWER
Big Sandy Area
765 kV
345 kV
138 kV
69 kV
46 kV
34.5 kV
Stations
Generating Stations

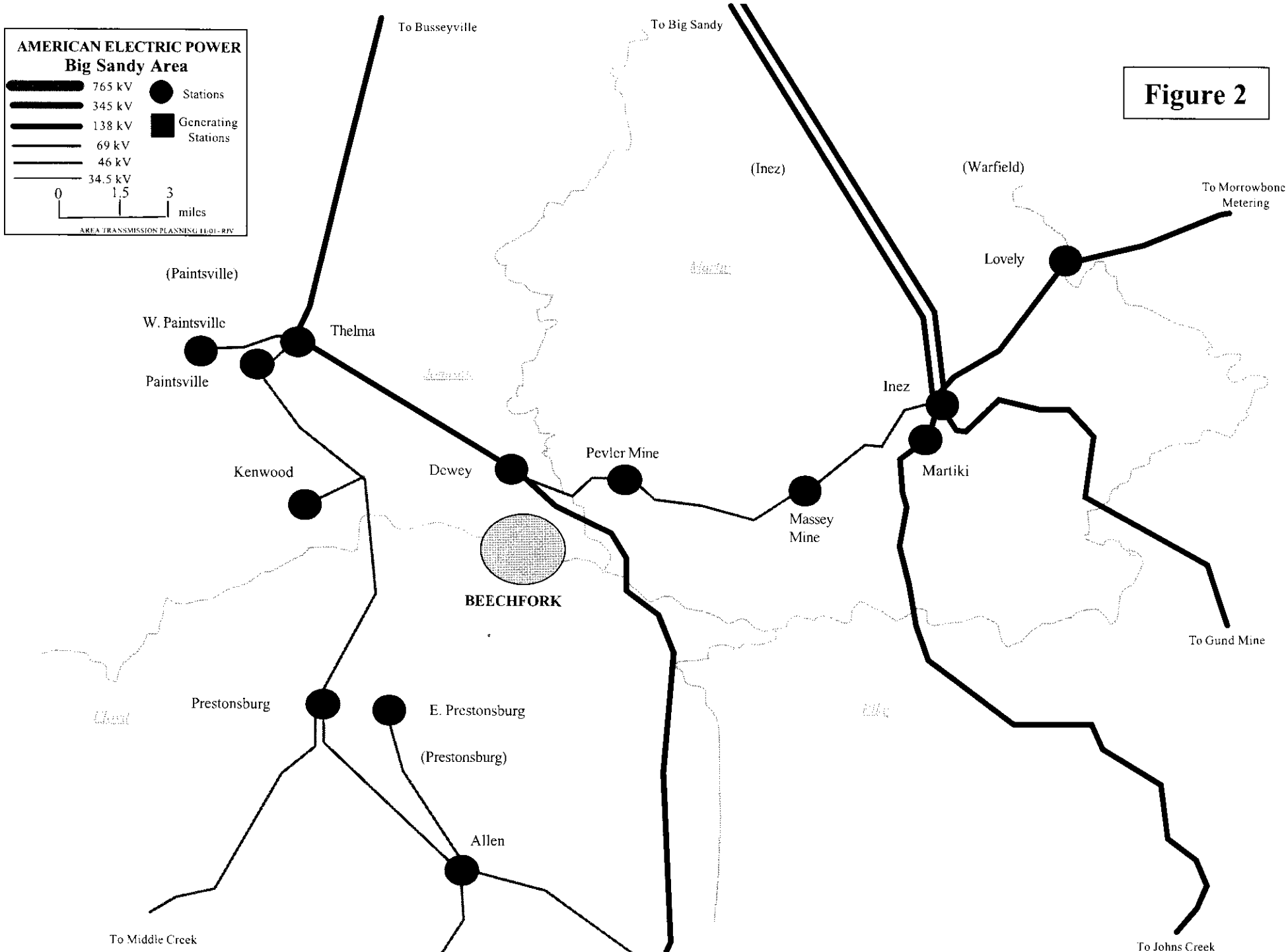

AMERICAN ELECTRIC POWER
Big Sandy Area
765 kV
345 kV
138 kV
69 kV
46 kV
34.5 kV
Stations
Generating Stations
0
1.5
3
miles
AREA TRANSMISSION PLANNING 11/01 - RJV
Figure 2
To Busseyville
To Big Sandy
(Inez)
(Warfield)
To Morrowbone Metering
Lovely
(Paintsville)
W. Paintsville
Thelma
Paintsville
Inez
Martiki
Kenwood
Dewey
Pevler Mine
Massey Mine
BEECHFORK
To Gund Mine
Prestonsburg
E. Prestonsburg
(Prestonsburg)
Allen
To Middle Creek
To Johns Creek

Figure 3

SIMPLIFIED DEWEY – INEZ 69 kV LINE